OCTOBER 1954

The Paper Industry

at **THILMANY**

. . . a well washed pulp is a "must" for the high grade papers produced in this specialty mill!

Very clean pulp with low dilution is essential to low cost of operation at Thilmany Pulp and Paper Co., Kaukauna, Wisconsin. These requirements were *guaranteed* by SWENSON and subsequent operations disclosed better-than-guaranteed performance. Like Thilmany, why not discuss your pulp washing needs with SWENSON.

SWENSON EVAPORATOR CO.
15653 Lathrop Avenue, Harvey, Illinois

Get The Complete Report!
A 6-page paper recently issued gives the full Thilmany story. Write for a copy now!

SWENSON

Proved Engineering for the Process Industries

SINCE 1889

A Division of WHITING Corporation

TR v.36 no 0'54-Mr'55

Asten DRYER FELTS

It takes team play to make longer runs

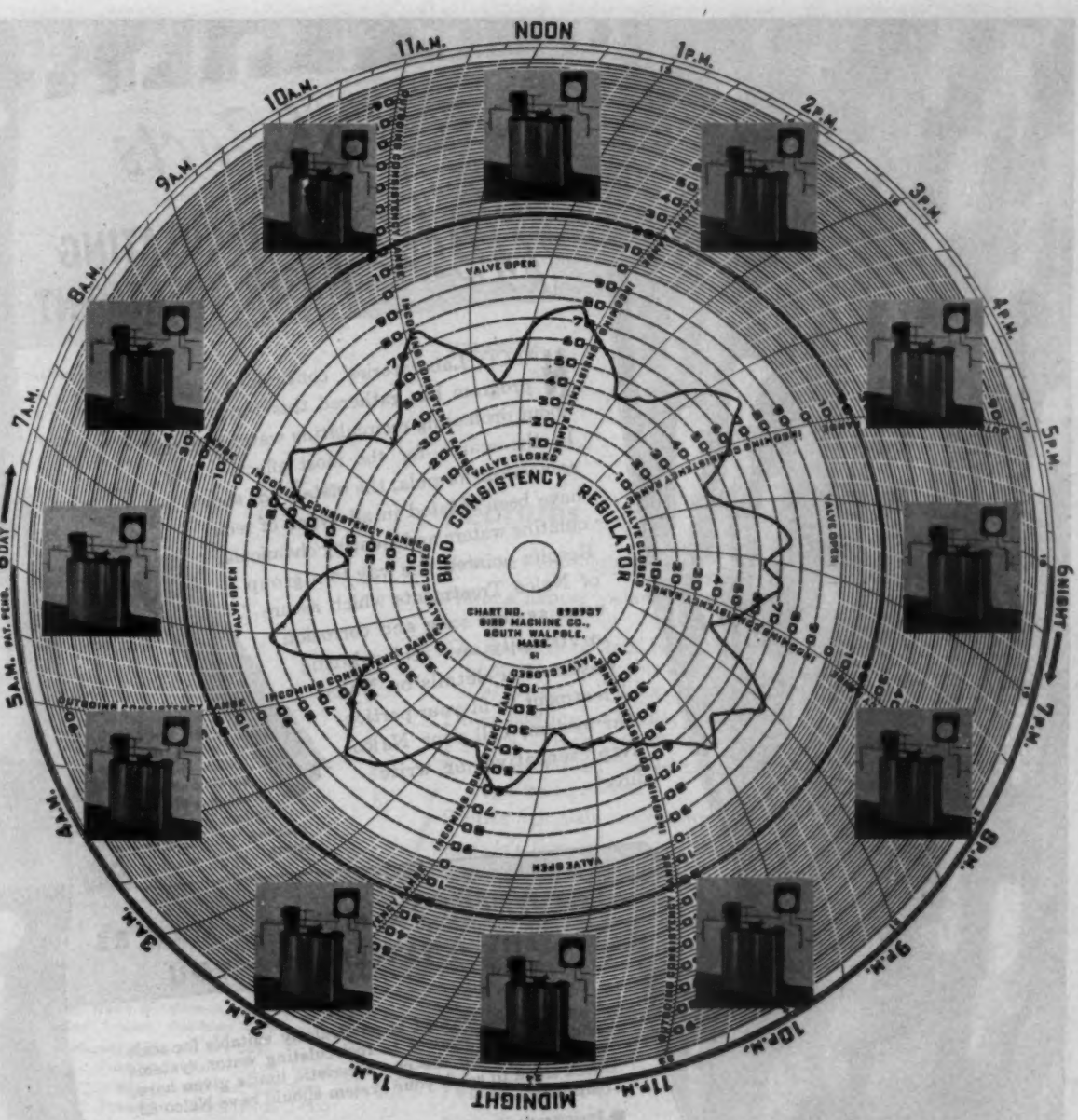
Getting the most out of a dryer felt boils down to getting the best felt for your drying conditions. ASTEN users achieve efficient performance with minimum wear by closely cooperating with their ASTEN representative. Also participating are the people who build ASTEN quality into the felts and give them precise characteristics according to signal.

Economy in the long run

ASTEN-HILL MFG. CO.
PHILADELPHIA, PENNA.

ASTEN-HILL LIMITED
VALLEYFIELD, QUEBEC

Tech

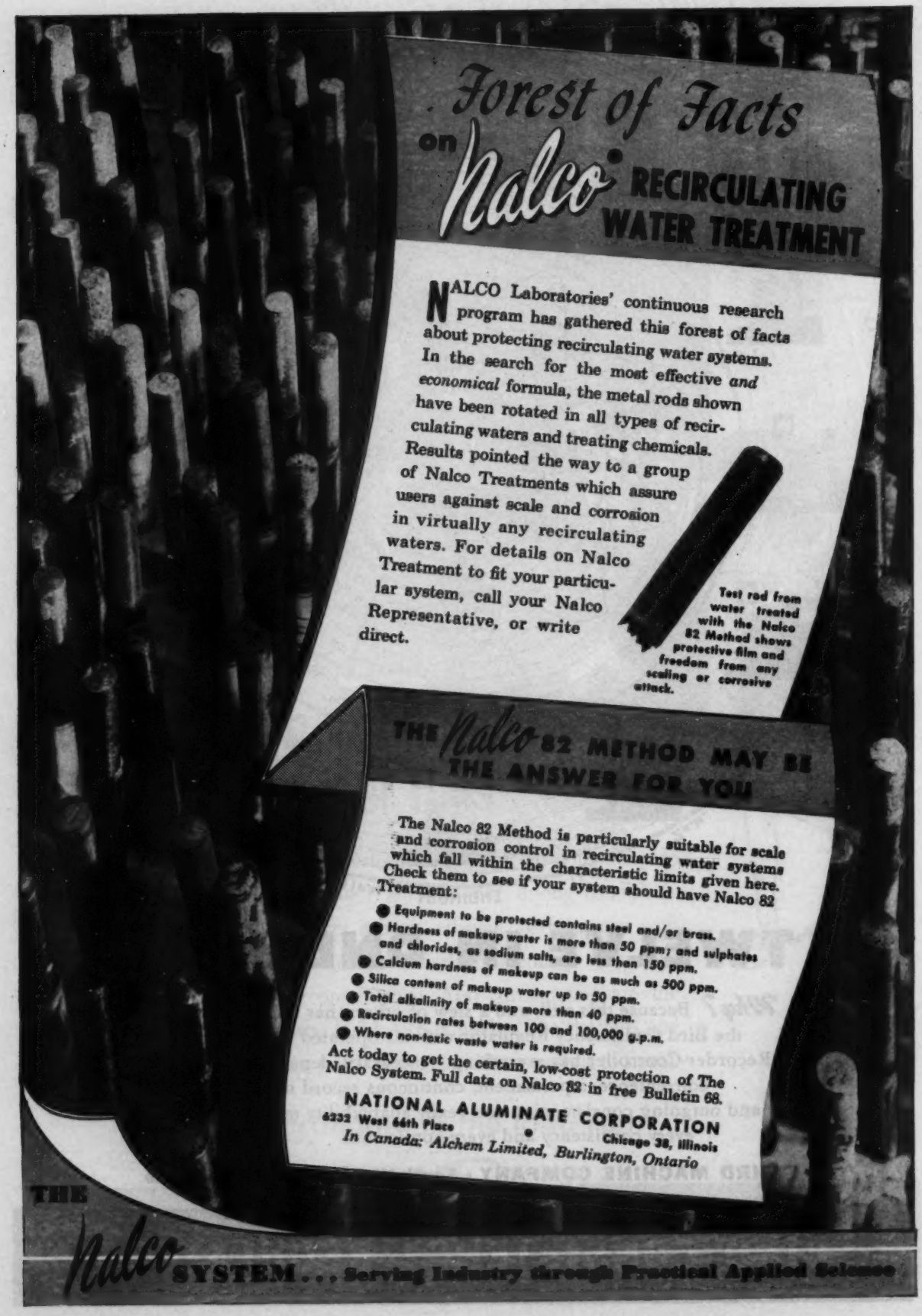


TWELVE IN ONE MILL

Why? **Because this mill, and a slew of others, has found that the Bird Consistency Regulator with air operated Recorder-Controller has everything — accuracy, dependability, convenience, a permanent, continuous record of both incoming and outgoing consistencies, and ready adaptability to every consistency and every application.**

BIRD MACHINE COMPANY · South Walpole · Massachusetts

BIRD CONSISTENCY REGULATORS


Forest of Facts
on Nalco RECIRCULATING WATER TREATMENT
NALCO Laboratories' continuous research program has gathered this forest of facts about protecting recirculating water systems. In the search for the most effective and economical formula, the metal rods shown have been rotated in all types of recirculating waters and treating chemicals. Results pointed the way to a group of Nalco Treatments which assure users against scale and corrosion in virtually any recirculating waters. For details on Nalco Treatment to fit your particular system, call your Nalco Representative, or write direct.
Test rod from water treated with the Nalco 82 Method shows protective film and freedom from any scaling or corrosive attack.
THE Nalco 82 METHOD MAY BE THE ANSWER FOR YOU
The Nalco 82 Method is particularly suitable for scale and corrosion control in recirculating water systems which fall within the characteristic limits given here. Check them to see if your system should have Nalco 82 Treatment:
Equipment to be protected contains steel and/or brass.
Hardness of makeup water is more than 50 ppm; and sulphates and chlorides, as sodium salts, are less than 150 ppm.
Calcium hardness of makeup can be as much as 500 ppm.
Silica content of makeup water up to 50 ppm.
Total alkalinity of makeup more than 40 ppm.
Recirculation rates between 100 and 100,000 g.p.m.
Where non-toxic waste water is required.
Act today to get the certain, low-cost protection of The Nalco System. Full data on Nalco 82 in free Bulletin 68.
NATIONAL ALUMINATE CORPORATION
6232 West 66th Place • Chicago 38, Illinois
In Canada: Alchem Limited, Burlington, Ontario
THE Nalco SYSTEM . . . Serving Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 36 • NUMBER 7 • OCTOBER 1954

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The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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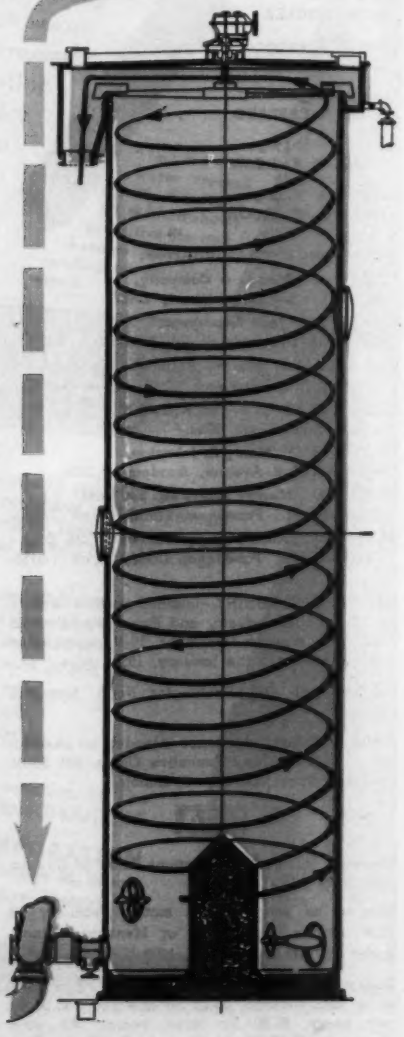
Good Bleaching

STARTS HERE



IMPCO CHLORINE SAVER-MIXER

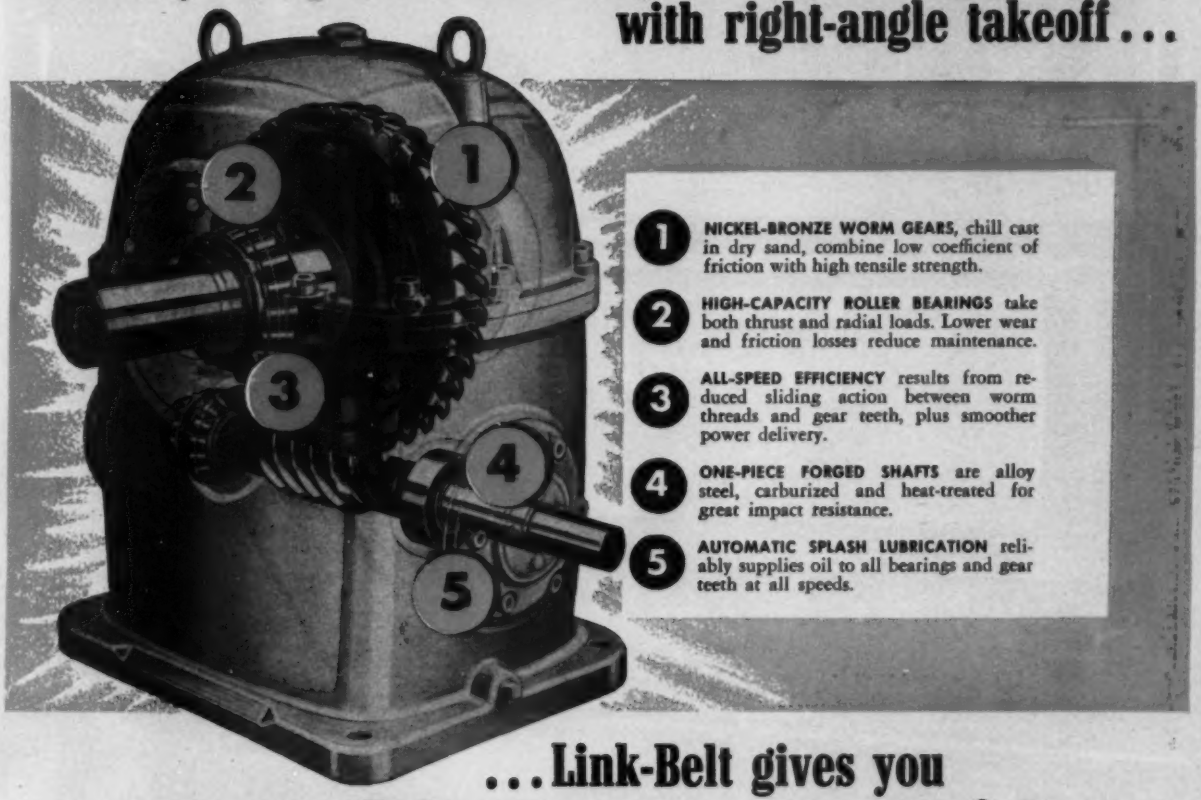
A new high intensity type chlorine mixer which gives a quick intimate mixing result, improving retention in the main tower and insuring uniformly chlorinated pulp.

This unit showed chlorine savings of 50c per ton or at a 300 ton daily production rate, over $40,000 per year, paying for the mixer in just a few months.

IMPROVED MACHINERY INC.

Sherbrooke Machineries Ltd. Sherbrooke, Quebec manufacture similar equipment in Canada. C3-a

When your speed reduction job calls for high ratios with right-angle takeoff...



1. **NICKEL-BRONZE WORM GEARS,** chill cast in dry sand, combine low coefficient of friction with high tensile strength.
2. **HIGH-CAPACITY ROLLER BEARINGS** take both thrust and radial loads. Lower wear and friction losses reduce maintenance.
3. **ALL-SPEED EFFICIENCY** results from reduced sliding action between worm threads and gear teeth, plus smoother power delivery.
4. **ONE-PIECE FORGED SHAFTS** are alloy steel, carburized and heat-treated for great impact resistance.
5. **AUTOMATIC SPLASH LUBRICATION** reliably supplies oil to all bearings and gear teeth at all speeds.

...Link-Belt gives you

everything you want in WORM GEAR DRIVES

With their compact, high-strength design, Link-Belt Worm Gear Drives permit high-ratio speed reductions in small space. High input speeds and low output speeds are provided, with ample capacity for heavy loads.

Three basic types cover the complete field of application: Single worm gear drives, helical worm gear drives and double worm gear drives. All are available with either horizontal or vertical shafts, and single or double gear reductions for convenient and compact connection.

Link-Belt Worm Gear Drives are available in 3.1:1 to 8000:1 reduction ratios, 1400 to 123,000 in. lbs. torque—0.22 to 564 output shaft rpm. Ask for Book 2324-A.

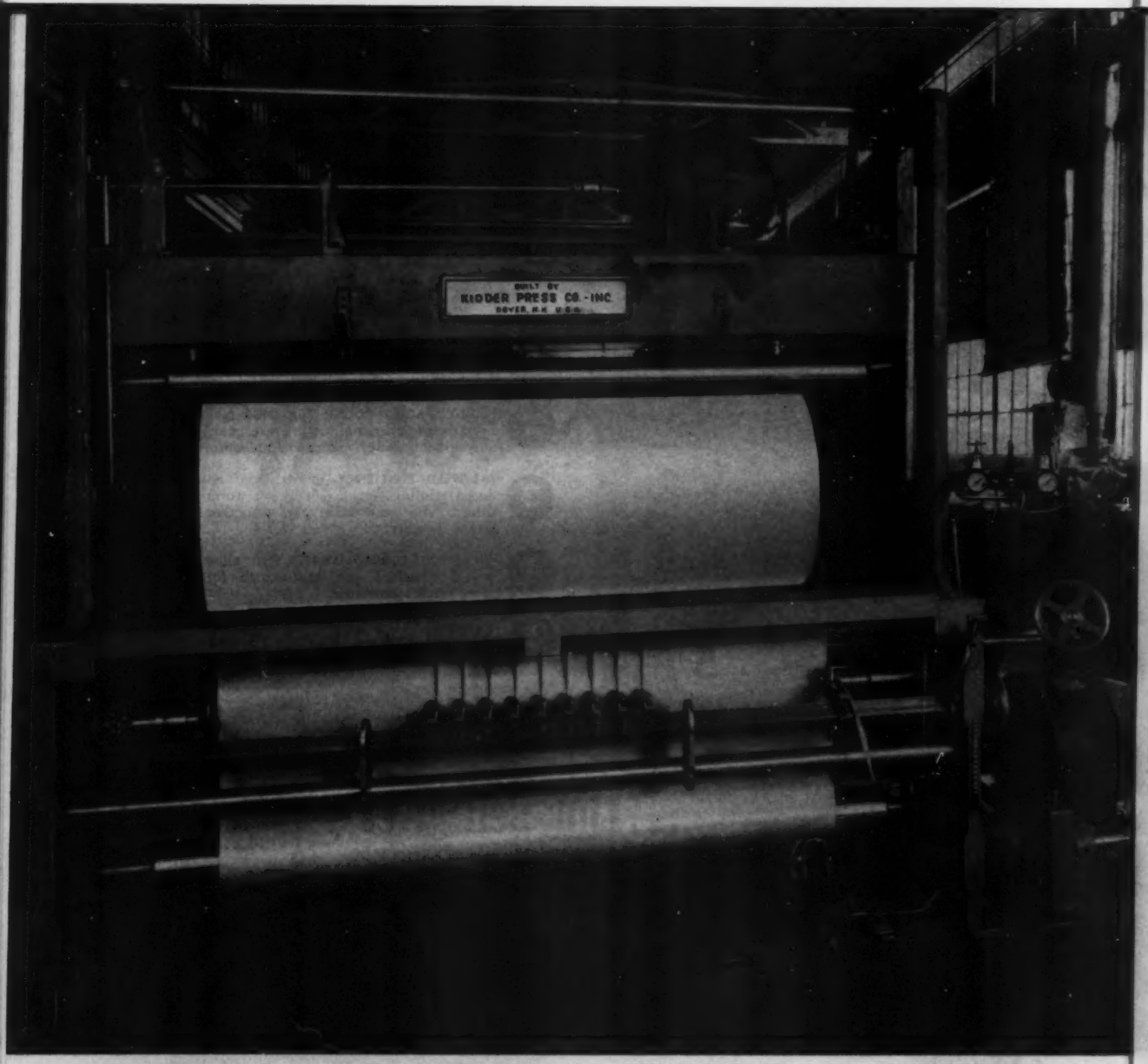
LINK-BELT 13,402

ENCLOSED GEAR DRIVES

WHY PRE-INTEGRATED LINK-BELT DRIVES CUT YOUR POWER TRANSMISSION COSTS

In addition to all three types of enclosed gear drives, Link-Belt builds variable speed drives, fluid drives—chains, sprockets, couplings, bearings, shafting, etc. All are pre-engineered for easy installation and maximum efficiency.

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.



No Other Slitter offers you the cost-cutting, gearless construction of the Kidder Model G. T. Many other advancements make it ideal for handling stock ranging from 200 pound tag to the lightest tissue.

When you're measuring slitting-accuracy in thousandths...

nothing can equal Kidder shear cutting. On this Kidder Model G. T. Slitter, for example, the back cutters controlling the width of cut cannot move, and the front cutters are self-sharpening. This advanced shear-cut method — standard on all Kidder Slitters — assures maximum accuracy, long service life, dust-free slitting and positive roll separation.

In addition, the Model G. T.'s gearless drive design (introduced by Kidder in 1949) plus anti-friction bearings and dynamic balancing help keep maintenance at its very lowest.

These are just a few of the reasons why you can count on the Model G. T. Slitter for continuous high speed, high production operation, with negligible down time. For full particulars on the Model G. T. and on all Kidder Slitters and Winders, write to Kidder Press Company, Inc., Dover, New Hampshire.

Kidder

3 POINT SLITTERS

High Speed Operation
Dust-Free Cutting • Easy Roll Separation

"You see Powell Valves everywhere! And with . . .

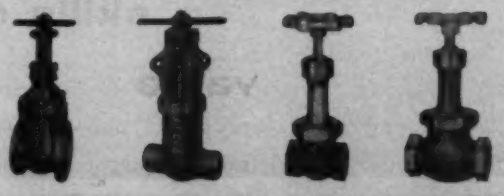
. . . good reason! They're famous for dependability. Economical, too.
What's more, Powell has a complete line."

Just name the valve needed...

. . . POWELL CAN SUPPLY IT! Small wonder—since Powell probably makes more kinds of valves and has solved more valve problems than any other organization in the world.

Available through distributors in principal cities. In bronze, iron, steel and corrosion resistant alloys. ⅛" to 30" and 125 pounds to 2500 pounds W.S.P. On problems, write direct to The Wm. Powell Company, Cincinnati 22, Ohio.

CONTROLS FOR THE LIFE LINES OF INDUSTRY



Powell Valves 108th year

gearless drive design (introduced by Dover, New Hampshire. Dust-Free Coiling • Easy Roll Separation

value in a fine product

reflects the experience and

skills of its makers.

value in Fourdrinier wires is a matter of record ... paper quality and production records in mills throughout America reflect the fact that Appleton Wires are Good Wires!

APPLETON WIRE WORKS, INC., APPLETON, WISCONSIN

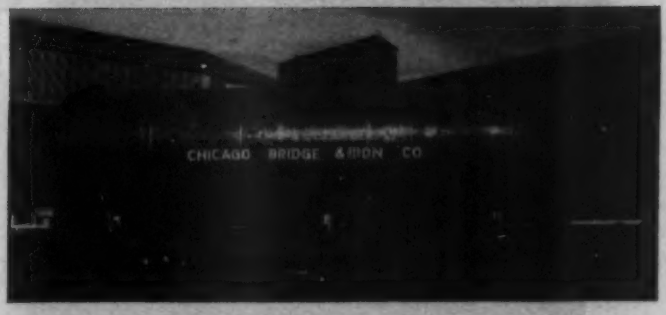
4 new HORTON DIGESTERS for Mead Corporation

The four pulp digesters shown here were recently built by Chicago Bridge & Iron Company for the Mead Corporation at Chillicothe, Ohio. These 11-ft. 7-in. diam. by 51-ft. structures were built to "take it" under the constant working strain of heat, cooking liquor and pressure.

Exacting quality controls, years of experience and up-to-date facilities assure the high quality of Horton steel plate work for the pulp and paper industry. Chicago Bridge & Iron Company builds tanks from carbon steel, carbon steel clad or lined with corrosion-resistant metal or solid non-corrosive metal whenever mill conditions require it.

As your mill requires welded steel plate structures for greater efficiency, new processes, or to keep pace with growing demands for paper products, take advantage of the experience and facilities of CB&I. Write our nearest office for estimates or quotations. There is no obligation on your part.

The digesters shown here are among the structures recently built by CB&I for the Mead Corporation at Chillicothe, Ohio.



CHICAGO BRIDGE & IRON COMPANY

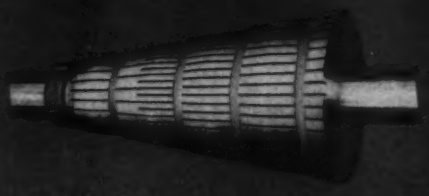
Atlanta, 3.....2143 Healey Building
Birmingham, 1.....1511 North 50th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Midland Building
Detroit, 26.....1566 Lafayette Building
Houston, 2.....2143 C & I Life Building
Los Angeles, 17.....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3....1653—1700 Walnut Street Building
Pittsburgh, 19.....3231 Alcoa Building
Salt Lake City, 4.....527 West 17th South Street
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1631 Hunt Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

In Canada: HORTON STEEL WORKS LIMITED, FORT ERIE, ONT.

ED Jones

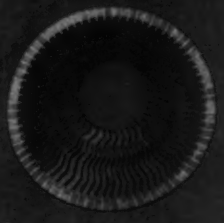
has the answer to your Maintenance and Modernization Problem



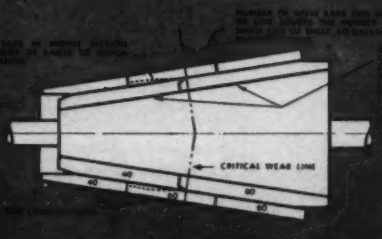
Famous Jones engineering, and over one-hundred years' experience with every type mill and all kinds of paper, are at your service . . . insure satisfaction, whatever your requirements, when you specify JONES maintenance, repair and modernization parts and accessories.

JORDAN PLUGS AND FILLINGS

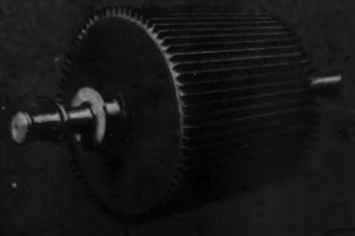
Type P-B PLUG. Dynamically balanced at operating RPM. Easy refilling — no bands to shrink on. Bands mounted permanently in place. Made in sizes to fit any make or size of Jordan.



Greylock Shell Filling. Pre-assembled in a rugged conical assembly. Harrigan design with patented Nowave feature. Bars and woods of any desired standard materials.



Nowave Patented Plug & Shell Fillings provide precise plug and shell alignment, better and more uniform refining, straighter bar wear — no waves or shoulders, longer filling life.



BEATER ROLLS AND BED PLATES

Built in all types and sizes for any make of beater, JONES Beater rolls, bars, woods and bed plates incorporate advanced design, sturdy construction and the finest of workmanship and materials.

On every maintenance or replacement problem, it will pay you to consult your Jones representative *first*.

ED Jones

E. D. Jones & Sons Company, Pittsfield, Mass.

ALITY STOCK PREPARATION MACHINERY

In Canada: The Alexander Fleck Limited, Ottawa

Reduce replacement costs with

STOCKHAM
NICKEL IRON GATE VALVES

corrosion resistance at low cost

Stainless Steel Trim with strong, corrosion resisting Nickel Iron body and bonnet, makes this an ideal valve for pulp processing lines and general paper mill service. Solid wedge disc, accurately machined to proper taper on both sides, is reversible.

Can be furnished with cleanouts to remove sediment without dismantling valve. Also available with bypass.

Adherence to rigid specifications, continuous testing of materials, and machining to extremely close tolerances are combined at Stockham to produce your best valve buy.

VALVES: Bronze • Iron Body • Steel Wedgeplug Dry Plug

FITTINGS: Cast Iron Screwed Flanged Cast Iron Drainage • Malleable Fittings & Unions

[redacted]

GENERAL OFFICES AND PLANT
BIRMINGHAM 2, ALABAMA
Warehouse Stocks and Sales Services Strategically Located

DISTRIBUTED THROUGH WHOLESALERS

MURCO

BACKED BY OVER 70 YRS EXPERIENCE

...symbol of a specialized

service

to the paper industry

Write.....

for complete catalog information on any item in which you are interested . . no obligation for our engineering department recommendations.

- MURCO Re-Chipper
- MURCO Knot Screens
- MURCO Knot Drills
- MURCO Chip Crusher
- MURCO Stainless Steel Flat Screens
- MURCO Level Vibrating Double Deck Chip Screen
- MURCO Pulpwood Slasher
- MURCO Quick Opening Gate Valves
- MURCO Hydraulic Roll Lowering Table
- MURCO Roll Heading Machine
- MURCO Collard Pneumatic Windershafts
- MURCO Windershafts

Plus MURCO Unit Heaters and Blast Coils

- MURCO Multiple Knife Wood Chipper
- MURCO Multiple Knife Chipper Discs
- MURCO V-Type Spout for Pulpwood Chippers
- MURCO High Speed Waste Wood Chipper
- MURCO mechanical feed Waste Wood Chipper

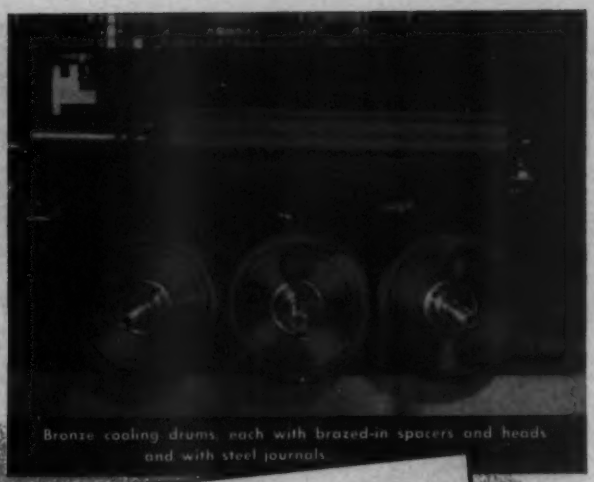
MURCO HIGH SPEED MULTI-KNIFE CHIPPERS

Designed to produce better chips with less sawdust and fewer slivers, free from repairs, while at the same time having production records of 100 cords or more per hour . . . made in sizes 36", 50", 54", 60", 75", 84" 86", 88", 90", 16.. 110", 120", and even 153".

D. J. MURRAY MANUFACTURING CO

Manufacturers Since 1883 • Wausau, Wisconsin

Centrifugally cast bronze suction press roll shell being drilled on special machine developed by Shenango.



Bronze cooling drums, each with brazed-in spacers and heads and with steel journals.

Why it pays to Specify Shenango

BECAUSE of Shenango's centrifugal casting process and high precision machine work, Shenango-made rolls and roll assemblies give better service, last longer and save you dollars. Centrifugal casting provides stronger, pressure-dense metal, finer, more uniform grain and freedom from sand inclusions, blowholes and other weakening defects.

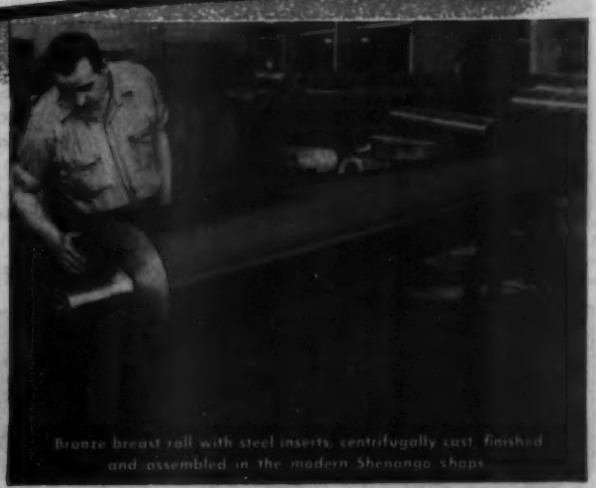
Shown on this page are only a few of the many types of rolls, roll cores, drums and assemblies produced in bronzes and Meehanite Metal by Shenango for use in the paper industry.

It will pay you to specify Shenango. For further information or data on meeting your specific needs, write to: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (*Executive Offices: Pittsburgh, Pa.*).

SHENANGO

ALL RED BRONZES · MANGANESE BRONZES · ALUMINUM BRONZES
MONEL METAL · NI-RESIST · MEEHANITE METAL

Stretch beam rolls (for Fourdrinier wire cloth) produced by Shenango in centrifugally cast Meehanite Metal.



Bronze breast roll with steel inserts, centrifugally cast, finished and assembled in the modern Shenango shops.

at 180 MILES PER HOUR!

● **THE TIME: 8:00 A. M. . . . THE PLACE: BUFFALO AIRPORT DESTINATION: WOODLAND, MAINE**

A Lockport Felt Company Technical Service Representative, Richard S. Buckley takes off (left), with Company Pilot Don Goodridge for Woodland, Maine, location of the St. Croix Paper Company. Trips like this are routine for Lockport executives, production heads, sales and service representatives. Lockport's experience with company-owned planes for special service and deliveries began in 1931 . . . another Lockport Felt "First."

● **5 HOURS LATER . . . ST. CROIX PAPER MILL, WOODLAND, MAINE**

Dick Buckley checks a TENAX FELT on a St. Croix Machine, with Mill Superintendent F. L. Coons.

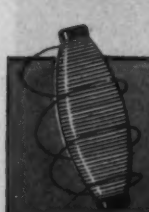
No matter where, or when, or how quickly any paper mill needs technical assistance in any phase of felt operation . . . a Lockport Representative can be on hand . . . in hours if necessary. The Lockport Felt Company's twin-engine Beechcraft is based at Buffalo Airport . . . just 24 miles from the Newfane Plant. This Technical Service is available to any paper mill, without obligation.

● **9:00 A. M. NEXT DAY . . . THE PLACE: LOCKPORT FELT'S HOME OFFICE**

Technician Buckley, returned with his findings, confers with Vice-President in Charge of Sales W. W. Campbell, Jr., Designer F. P. Heil, General Superintendent Howard F. Brown, Production Superintendent R. J. Capen (standing), and Assistant to General Superintendent Friedrich Troeltzsch.

This scene could be duplicated nearly every working day at the Lockport Plant . . . TENAX designers and production experts in the process of planning, designing, selecting correct yarns, setting up production schedules, mastering all of the myriad details involved in making TENAX FELTS. They have the same goal always . . . more paper at lower cost, with TENAX FELTS.

TENAX FELTS ARE FIRST IN SERVICE



LOCKPORT FELT CO.

NEWFANE, NEW YORK

TENAX FELTS

With the All-Motor

ALL-STEEL FALK

you can interchange motors in minutes... *on the job!*

Fast, easy maintenance gives savings in time and money

With the *all-steel*, All-Motor type FALK Motoreducer . . . the only complete and compact motorized reducer with a separately mounted, resilient Steelflex coupling-connected motor . . . you can replace or interchange motors, *or even parts*, in minutes—*on the job*, without long and costly "down time"! Ratios can be changed (within capacity) without motor modification.

Any make, speed, or type of standard foot-mounted motor within the unit's AGMA rating is usable *without modification* on this All-Motor type Motoreducer. Motors with variable speed drive arrangement can be used, if desired. No "partial" motor or special shaft is required in event of motor replacement—simply use a complete motor, available for quick delivery from factory or local stocks without expensive delays.

Add to these exclusive maintenance-saving advantages the FALK "In-built" Factors, described at the right, and you have an unbeatable combination of quality, application adaptability, dependability, long-range economy, and dollar-for-dollar value. Write for Bulletin 3104.

Every FALK Motoreducer has these "In-built" Factors—

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

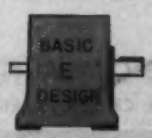
Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

Streamlined Inside and Outside. Smooth, clean surfaces; machine welded construction conforms to NEMA motor frames.

Sealed Housings. Dual closures and one-way vents keep oil *in*, dust and moisture *out*. Units are splash-proof, leakproof, dustproof.

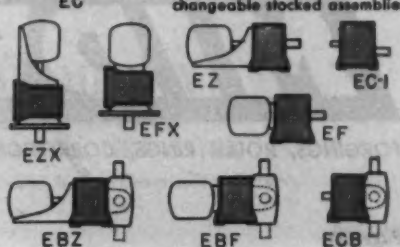
Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.



EC

The basic E design permits maximum use of standardized parts . . . closer control over materials, processing, inspection and assembly . . . resulting in faster delivery from interchangeable stocked assemblies.



FALK ...a good name in industry

THE FALK CORPORATION · 3001 W. Canal St. · Milwaukee 8, Wis.

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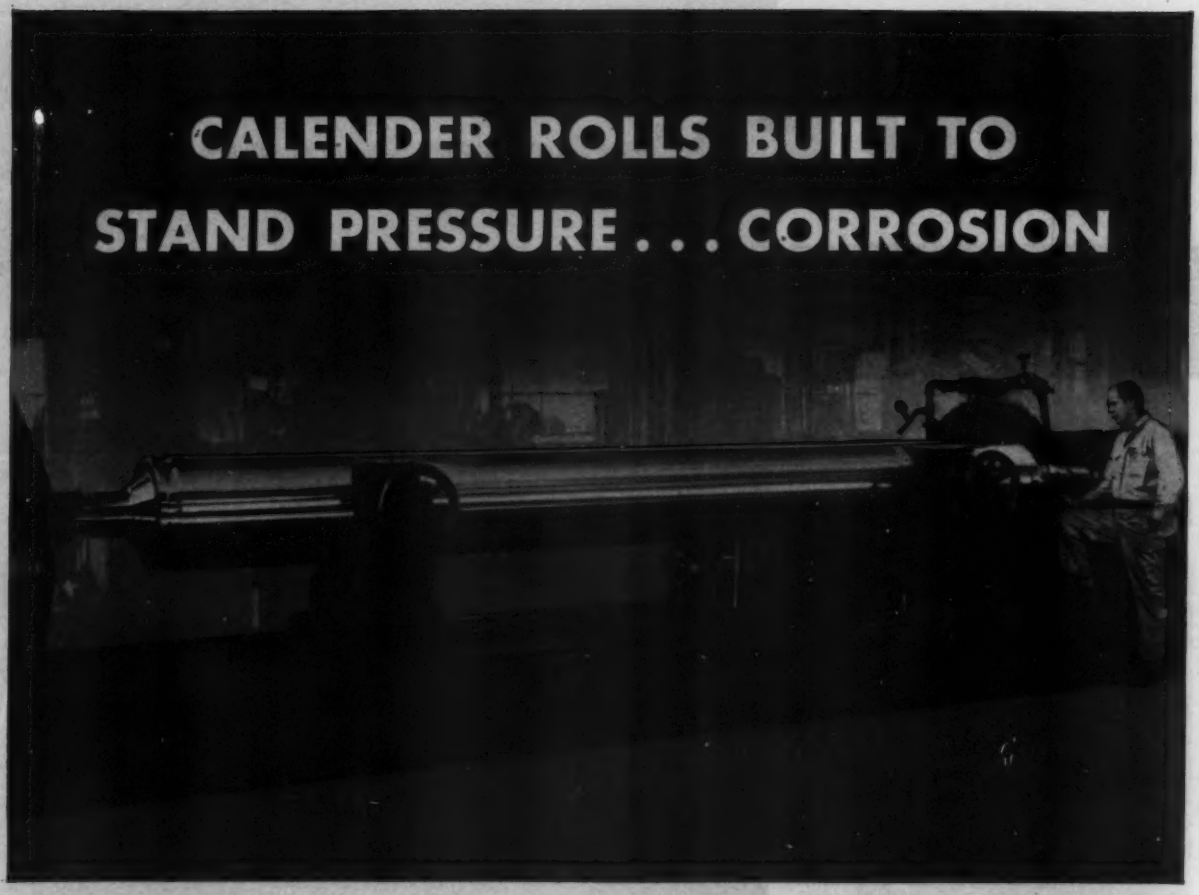

MIDVALE *Forged* STAINLESS STEEL ROLLS

RESIST CORROSION...LAST LONGER...REQUIRE FEWER REGRINDS

High rolling pressures . . . corrosive operating conditions . . . smoother finishes specified—these are the requirements Midvale rolls are built to meet. From coast to coast where regular rolls in the water box position pitted and corroded Midvale Stainless Steel Rolls are still going strong.

For all types of rolls up to 228 inches in length . . . alloy or stainless steel Midvale quality starts with the forging. The finest steel is melted by Midvale, expertly heat treated, carefully forged, precision ground.

For wet-end or finish-end, calenders, super calenders, sleeve and mandrel assemblies—specify Midvale rolls. Fine mirror finishes can be furnished to any hardness up to 100 Shore for forged alloy and 70 minimum Shore for stainless steel. Midvale Rolls are made to your mill's requirements. Get your copy of the Midvale bulletin on selecting rolls for your mill.

THE MIDVALE COMPANY- Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

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saleable

more tons per day

In analyzing production records, paper mills find that Albany Felts give *more tons per day*. Of equal importance, they are consistently producing more *saleable* tons! Time after time, Albany Felts show record production of saleable stock by maintaining sheet quality and greatly reducing rejects. This is further translated into more mill profit.

The big difference between Albany Felts and others is in the unparalleled combination of Albany's advanced research program, custom-designing, rigid quality controls in manufacturing, and outstanding field service. These give you uniform top quality felts plus valuable help on your felt problems.

On his next visit, ask your Albany sales engineer to show you how production records in *your mill* will prove that Albany felts give you *more saleable tons per day*.

FREE! Felt Performance Record Book for Mill Superintendents, Managers, Purchasing Agents. Write for your handsome leather binder containing convenient forms for maintaining records and graphs of felt performance, felt inventory, etc.

ALBANY FELT COMPANY

"World's largest Manufacturer of Paper Machine Felts"

MAIN OFFICE AND PLANT, ALBANY 1, NEW YORK

Other plants: Hoosick Falls, N. Y., North Monmouth, Maine, Cowansville, Quebec.

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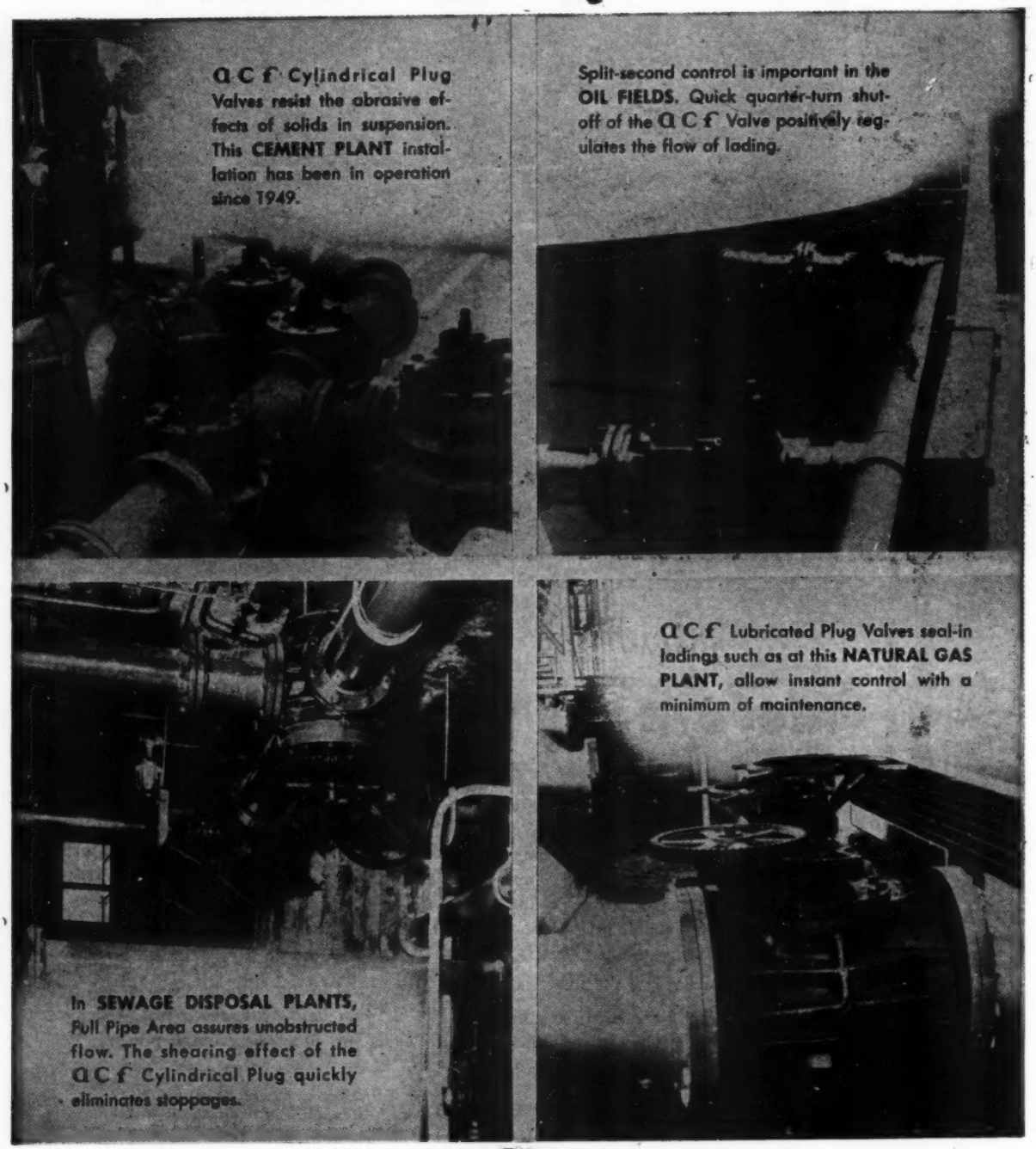
PROOF OF QUALITY


acf Cylindrical Plug Valves resist the abrasive effects of solids in suspension. This CEMENT PLANT installation has been in operation since 1949.
Split-second control is important in the OIL FIELDS. Quick quarter-turn shut-off of the acf Valve positively regulates the flow of lading.
In SEWAGE DISPOSAL PLANTS, Full Pipe Area assures unobstructed flow. The shearing effect of the acf Cylindrical Plug quickly eliminates stoppages.
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PLUG VALVES

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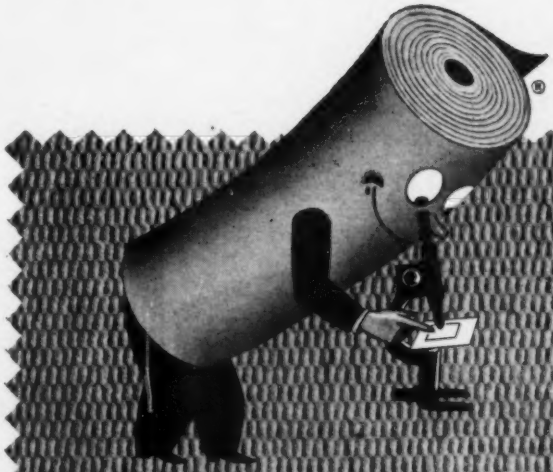
Makes The Big Difference In DRYER FELTS



WOODBERRY 887 REINFORCED DRYER FELT

Gives You Scientific Construction

Checking evenness of roving with Belger Tester. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

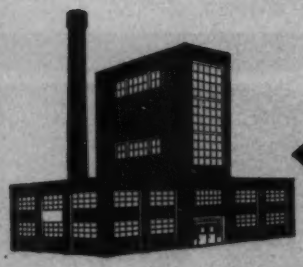
*Asbestos yarns woven into the face of patented Woodberry 887 dryer felts at scientifically determined intervals give you longer wear and smoother operation. Paper mills have learned to count on lowered steam consumption and consistent quality with Woodberry 887. For dryer felts that are low on cost, high on performance, specify Woodberry 887.

Mt. Vernon-Woodberry Mills

Main Office: 40 Worth St., New York
Branch Offices: Chicago • Atlanta
Baltimore • Boston • Los Angeles

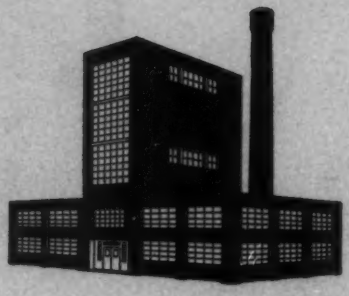
TURNER HALSEY COMPANY
Selling Agents

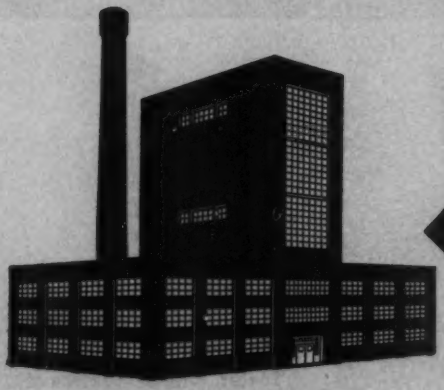
KAMYR
continuous cooking



30T/24H

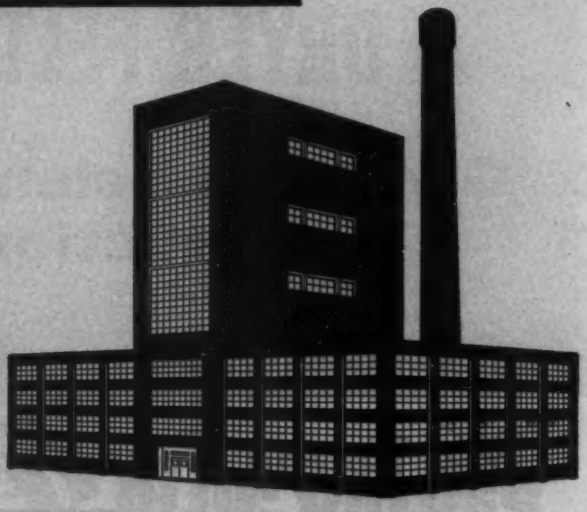
50T/24H



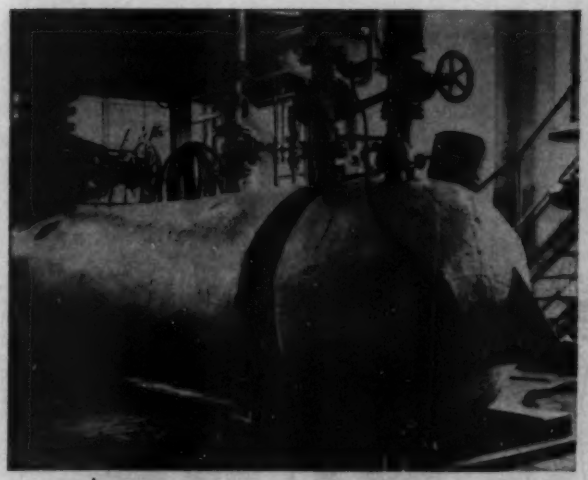


100T/24H

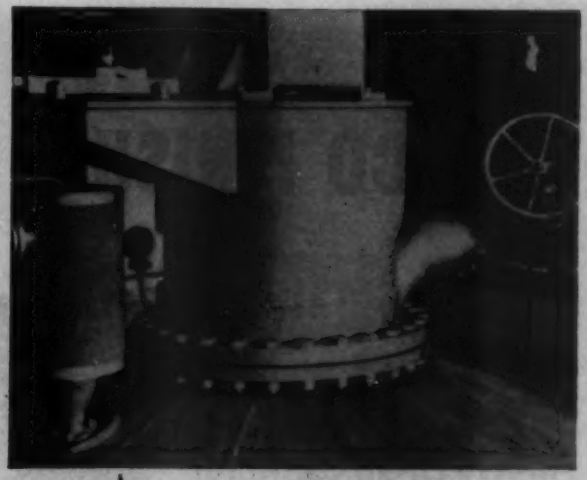
And Now:
200T/24H



For Information Contact KAMYR INC. Hudson Falls, N. Y.

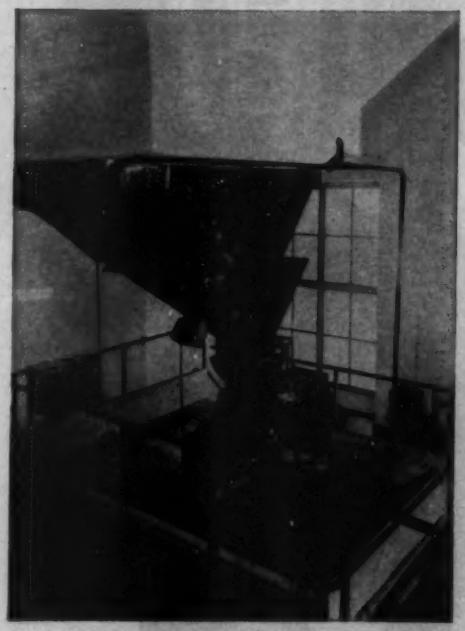


STEAMING VESSEL



TOP OF DIGESTER

KAMYR CONTINUOUS COOKING OPERATING VIEWS



CHIP FEED

TOP OF BLOW TANK

INSTRUMENT PANEL

AHCO FINISH C

. . . the FINISH that makes the COATING

Give heavily coated papers a new luster, a richer sheen and superior water repellency with AHCO FINISH C . . . the finish that makes the coating!

AHCO FINISH C is readily dispersible, easy to handle and will not darken or disintegrate on calendering.

Economical AHCO FINISH C binds pigments, adds resistance to rub off of heavy starch coats. Get efficient results with as little as 1.5 to 2.0% by weight on volume added to the paper coating mix.

AHCO FINISH C

AHCO PRODUCTS

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Technical Data and Product Sample on request

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wherever they go...
paper men know-
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make good paper!

FOR DESIGN • FINISH • SERVICE • UNIFORMITY • DEPENDABILITY

APPLETON WOOLEN MILLS
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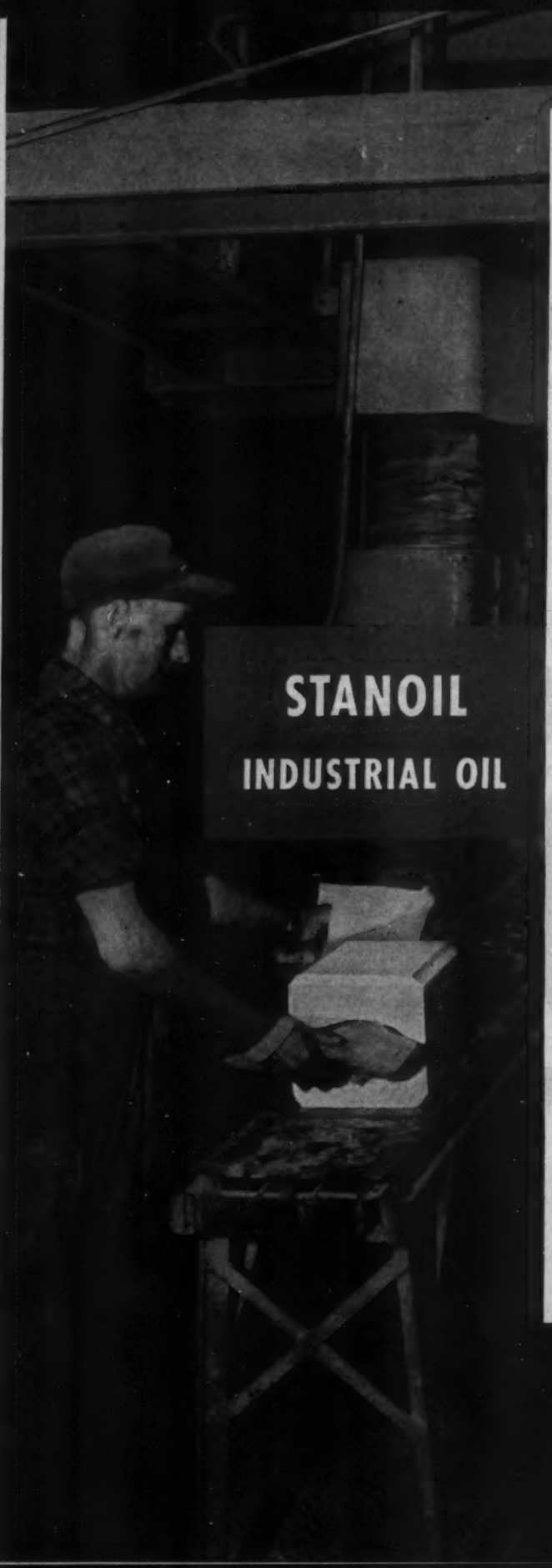


How a good oil earns its salt!

Here's a "salty" story about an oil with staying power. When this 100 ton hydraulic press was to be installed by the Morton Salt Company in their Manistee, Michigan plant, officials outlined to a Standard Oil lubrication specialist some of the rigid specifications the required oil should have. The new press would operate under a heavy load five days a week, and since the original fill would be large — 22 barrels — it was important that the oil installed resist oxidation and remain in good condition for long periods.

The Standard man recommended STANOIL Industrial Oil #25, a many-purpose oil having high stability and effective rust protection. In over seven years of hard service, the oil has never been changed! During this period, periodic tests of oil samples have shown that STANOIL, despite hard service and high oil-operating temperatures, has maintained a lubricating quality comparable *with a new oil.*

For information on how *you* can best use STANOIL in *your* plant, check with a specially trained and experienced Standard Oil lubrication specialist. He can help you save time and money. Call your nearest Standard office, or write to Standard Oil, Chicago.

STANDARD

STANDARD OIL COMPANY
(Indiana)

If You Want

1. More Uniform Sheet Moisture Control

2. Greater Production

This Offer Will Interest You:

The Armstrong Sheet Moisture Control for paper machines has been developed, and proven in service, to such a degree that we will let it prove itself in your mill on a *free trial basis* for 90-days.

We will ship you a complete control and supervise its installation. If it does not give you better control of sheet moisture than you are now experiencing or does not *completely satisfy you in every respect,* you may return it within 90-days and owe us nothing.

You will admit we must be sure of this Control or we could not afford to make such an offer.

It doesn't cost anything to take a look at Bulletin No. 268, describing the Armstrong Control. Just clip the coupon to your letterhead and mail it to us. There is no obligation.

ARMSTRONG MACHINE WORKS

816 Hoffman Street • Three Rivers, Michigan

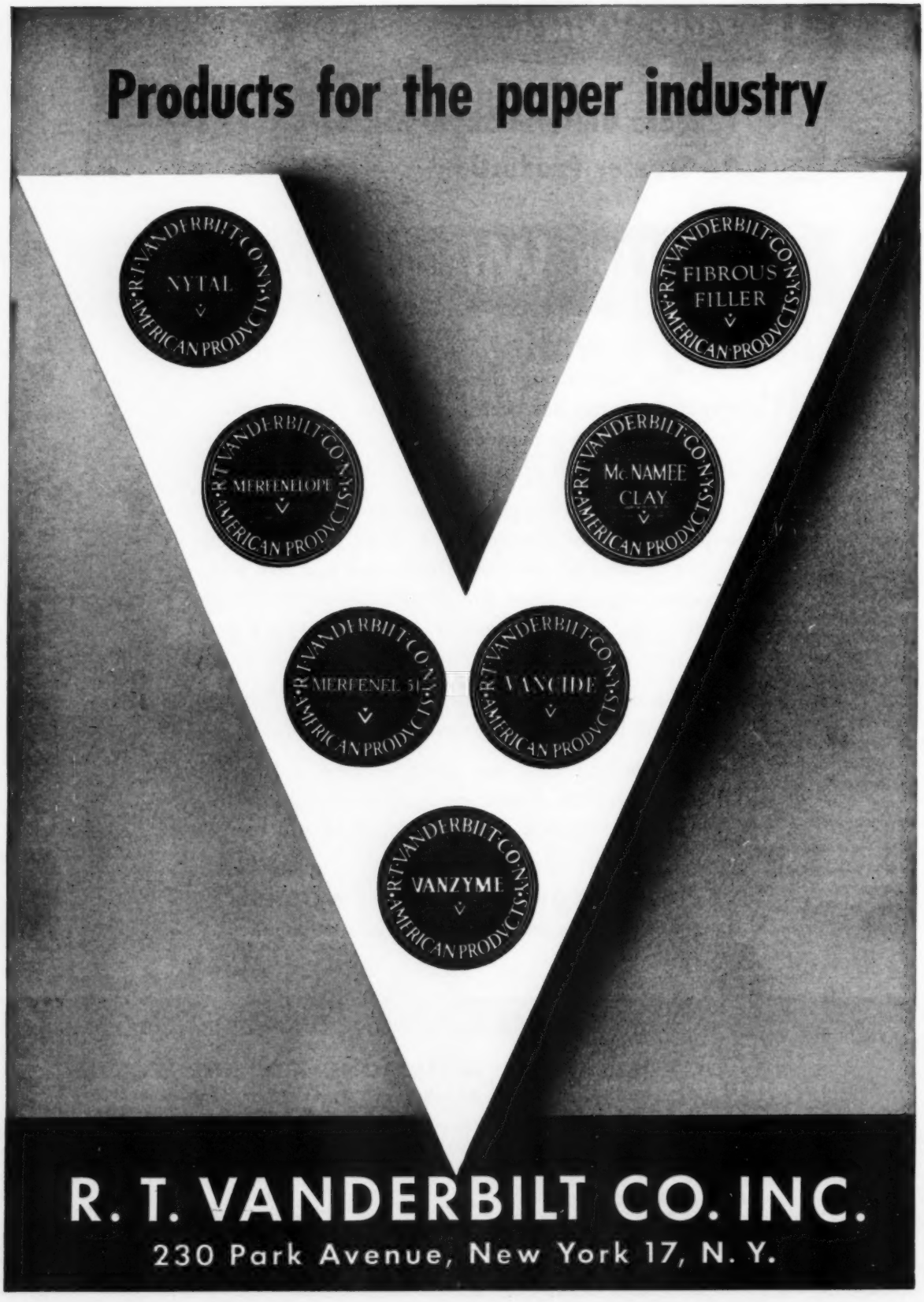
MOISTURE CONTROL
INDIVIDUAL DRYER TEMPERATURE CONTROL
DRYER DRAINAGE TRAPS
THERMAL AIR ELIMINATORS
STEAM HUMIDIFIERS

ARMSTRONG MACHINE WORKS
816 Hoffman Street, Three Rivers, Michigan

Please send Bulletin describing your Moisture Control for paper machines.

Name_____

(CLIP TO YOUR LETTERHEAD AND MAIL)


Products for the paper industry
R·T·VANDERBILT·CO·N·Y·
AMERICAN PRODUCTS
NYTAL
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MERFENEL 51
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R. T. VANDERBILT CO. INC.
230 Park Avenue, New York 17, N. Y.

The Paper Industry

October 1954

Productivity is at its best in a free society.

One of the early acquired facts of life that keeps us on our toes is the realization that things do not happen spontaneously. The tree will not resolve itself on demand into the cellulose and the lignin fractions, the cellulose fibers will not of themselves mass together to form sheets of paper and paper products, the research man does not produce new or improved products by magic wand, an uninformed public will know nothing of the new products and their uses, markets do not spring up spontaneously to absorb the mill's productive output, and the consumer does not automatically accept a new product — no matter how it excels in quality and application.

Things have to be set in motion, and productivity is the result of effective implementation and coordination of a whole chain of operations. This embraces capital investment, procurement of raw materials, research endeavors, process operations, production, market development, and even influencing the likes and dislikes of the ultimate consumer. For optimum productivity, all these operations must perform efficiently and, what is most important, must be kept in delicately controlled balance with each other.

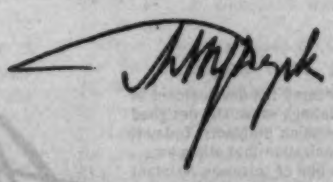
Today various nations and groups are testing the social and economic climate that is best suited for maximum productivity. The question is whether a voluntary or forced system, a relatively free or a rigorously controlled economy and society, is most conducive to increased productivity?

We must concede that, on occasions, a rigorously controlled society is capable of achieving isolated spectacular success that frequently dazzles and overwhelms the unwary or uninformed. By mobilizing its forces and putting the full pressure on one of the operations in the chain of productivity, a totalitarian state can make that particular operation excel in efficiency. But such sudden and spectacular manifestation of performance is invariably achieved at the expense of other operations affecting productivity, often completely throwing them out of balance. The chain of operations is subjected to strain by this imbalance, causing a feeling of resentment, distrust, and non-cooperation among the participants. Ultimately the public's resistance brings about the inevitable breakdown in productivity.

We see signs of this in the Russian experiment of rigid control, compulsory capitalization, and forced savings for industrialization, which deprive the workers and managers of both incentive and enthusiasm to create and produce. The result is an abuse of production machinery, waste of materials, and an inferior quality product output merely to satisfy a production goal — although in isolated cases achievements have been relatively spectacular.

For optimum and sustained productivity, we need a climate of social and economic freedom. Participants in any industrial enterprise do not want to be pushed around. They need freedom of capital investment, freedom of accomplishment, freedom of work, and freedom of marketing. It is under such conditions only that the chain of endeavors constituting productivity remains in perfect balance — each link developing at an overall uniform and confident rate.

There will be no weak links such as are constantly being discovered under a system of rigidly controlled economies that deny mankind one of its most precious attributes — the freedom of choice.



YOU GET

MORE MILS PER GALLON WITH AMERCOAT 33

Amercoat's higher solids content gives you a thicker, heavier coating—more mils for every gallon applied.

THIS MEANS YOU SAVE MONEY TWO WAYS ON MAINTENANCE PAINTING

Lower Material Cost. You save on material because it takes fewer coats of AMERCOAT 33 to build the required film thickness.

Lower Labor Cost. You save on labor because fewer coats mean fewer man hours for application—less down time, too.

In addition to more mil thickness per gallon, you get more protection per gallon. AMERCOAT 33 is formulated specifically for maximum chemical resistance and for severe weathering conditions. In major industries from coast to coast — chemical, petroleum, pulp and paper, food, and many others — maintenance engineers look to AMERCOAT 33 for low cost, long lasting protection for all types of steel or concrete structures.

Amercoat pioneered the development of protective coatings especially designed for severe corrosion problems. Today it is the only organization that offers you... a complete line of corrosion resistant coatings...nationwide distribution... trained technical men to give you on-the-job assistance throughout the United States and Canada.

Amercoat CORPORATION
Dept. D.
4809 Firestone Blvd.,
South Gate, California

Write today for the AMERCOAT 33 Technical Bulletin which gives a complete description of the coating's chemical and physical properties.

CURRENT COMMENTS

Laboratory diamonds . . . aim for simplification . . . and the box score

The Judiciary Committee of the House of Representatives has been given a 368-page highly optimistic report from the Department of Commerce on the use of hardwoods in the production of newsprint. The report contains no technical information not already common knowledge in the paper industry, but its estimates of the possibilities do not in all respects conform to the economic studies made by industry specialists. It is sufficient to state in this column merely that paper can be made from any vegetable fiber, and that the sole problem for the industry is whether or not certain woods and technical processes are commercially practical. Diamonds of top quality can be made in a laboratory, but it costs more to produce factory-made diamonds than they can be sold for in the market.

Paper industry prospects are still good. Total production in the first half of the year was 15,420,000 tons, as compared with 15,701,000 tons in the first half of 1953. Production of paper, however, was higher than in 1953, the slight drop of 1.8 per cent in total output being due to a much larger reduction in the production of paperboard. With an inrush of recent orders for paperboard, there is a possibility that the total tonnage for 1954 may even exceed 1953.

The tariff again

Formal notice has been served by President Eisenhower that a major part of his program for the next Congress will be the enactment into law of the provisions of the Randall Commission report. One part of the program, however, has been definitely delayed by the refusal of the last Congress to authorize a comprehensive rephrasing of tariff classifications. Congress instead instructed the Tariff Commission to make a study of the problem for Congressional action later. The Commission is to make its report within two years and will file a preliminary report on March 15. Such a reclassification might easily affect many grades of paper, of which there are already some 200 specific items. In the case of paper, many of the special classifications against which importers complain are due to injections of new descriptions into the original Tariff Act by various reciprocal trade agreements. The Tariff Commission has already begun its work by inviting domestic industries to present their views and arguments for or against changes in existing classifications. With a proclaimed aim for simplification, domestic industry is watching the situation closely to make certain that any future changes do not by a change of wording curtail the protection given in the present code.

Congressional box score

The administration is basing its campaign for an Eisenhower majority in Congress on the box score of the accomplishments of the present Congress. Some of the items in the box score as given out at Washington involve industry. These include the extension of social security to 10,000,000 persons not previously covered, with an increase in the "take" from the present workers' pay envelopes to help finance the new payments. Legislation affecting government finances are of indirect application to industry, on the basis of the tax burden to be levied. The revision of the tax schedule through a most complete recodification of all tax laws was important, particularly as the net result to industry is a reduction of income taxes for corporations and individuals. The revision was the first general revision in 75 years.

On the other side of the ledger the Democrats will point to the failure of Congress to agree to the administration's proposals for revision of the Taft-Hartley labor law.

The so-called compromise in tariff legislation by the extension of the Reciprocal Trade Agreement Act for one year instead of for three years with extensive amendments does not tell the story, as all other proposals for tariff revision were defeated.

The paper industry has fared well in its contacts with government agencies, particularly those concerned with the production and pricing of paper for governmental use.

Domestic industry will make vigorous comments on the use of the escape clauses of the reciprocal trade agreements when new legislation is requested after the first of the year. The President will be faced with a demand that he follow more closely the recommendations of the expert Tariff Commission when injury cases are referred to him with recommendations for relief to domestic industry. A new instance has been recorded where the President disagreed with the Tariff Commission findings in refusing to change the duty rates on hand blown glassware. The box score of presidential action on such recommendations has been a reversal in five cases and approval of the recommendations in only two cases.

Financial Reports

A temporary weakening of the market for securities did not materially affect paper mill stocks, as the market quickly shook off the slight attack of the blues and in some branches of industry reached new high levels.

Net Incomes

Celotex Corp.—Net income for the nine months ended July 31 was $1,958,670, as compared with $2,015,920 for the comparable period a year earlier.

Champion Paper & Fibre Co.—Net income for the three months ended June 30 was $2,387,209, as compared with $2,508,317 in the same quarter of 1953.

Crown Zellerbach Corp.—Net income for three months ended July 31 was $7,810,989, as compared with $6,106,000 for the same quarter of 1953.

Gaylord Container Corp.—Net income for the six months ended June 30 was $3,665,185, as compared with $3,511,107 a year ago.

Great Northern Paper Co.—Net income for the six months ended June 30 was $2,085,825, as compared with $2,372,047 in the comparable period of 1953.

Hammermill Paper Co.—Net income for the six months ended June 30 was $718,054, as compared to $659,071 in the same months of 1953.

Hollingsworth & Whitney Co.—Net income for the six months ended June 30 was

High machine speeds?
High temperature headbox stock?
You need NASH Vacuum Pumps!

Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

441 WILSON ROAD, SO. NORWALK, CONN.

Current comments . . .

$1,265,758, as compared with $1,185,896 a year ago.

International Cellucotton Products Co.—Net income for the first half of 1954 was $3,733,600, as against $3,518,600 a year ago.

Paper mill corporate changes

Stockholders of *Central Fibre Products Co.* of Quincy, Ill., and Mapes Consolidated Mfg. Co. of Griffith, Ind., will vote early in December on a merger proposal already approved by the diretcors of the two firms. The companies have been associated for more than 25 years, and Central Fibre has been sales agent for some of Mapes' principal products.

Scott Paper Co. has acquired the assets of Detroit Sulphite Pulp & Paper Co. in exchange for 125,092 Scott common shares. Shareholders of the Detroit firm were to receive three Scott shares for every five shares of Detroit common stock outstanding at the close of business August 30. . . . Scott directors have voted to split the firm's common shares two-for-one.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Sept. 10, 1954	Aug. 10, 1954
A.P.W.	3	*3-3¼
Celotex	22½	23¾
Same Preferred	17⅝	17⅝
Certain-Teed Prod.	19⅝	20⅜
Champion P & F	46⅝	46⅝
Same Preferred	107½	106
Chesapeake Corp.	38¼	36
Container Corp.	59	61⅛
Same Preferred	...	*103-105
Continental Diamond	12⅛	13¼
Crown Zellerbach	52	51⅝
Same Preferred	104	103
Dixie Cup	57½	*57¼-57¾
Eastern Corp.	22⅝	24⅛
Robert Gair	25⅜	26½
Gaylord Container	30½	36⅝
Great Northern	66¾	68¾
Hammermill	20⅝	19½
International	74⅝	75⅛
Same Preferred	105½	*104½-105¾
Kimberly-Clark	72½	71⅝
New — when issued	35⅝	...
Same Preferred	142	*143-144
MacAndrews & Forbes	44	43½
Marathon	26⅝	25½
Masonite	21	21⅜
Mead Corp.	38	38½
Same Preferred	98½	98
National Container	13⅝	13⅞
Same Preferred	34	35
Rayonier Inc.	42¾	41⅝
Same Preferred	38	38½
Scott Paper	95½	93⅝
Same $3.40 Pref.	95⅝	*94-95¼
Same $4.00 Pref.	104	*104-105
St. Regis Paper	29⅞	30⅝
Same Preferred	102	*101¾-103¼
Sutherland Paper	43⅜	44⅛
Same Preferred	149½	*153-157
Union Bag & Paper	61¾	59½
United B & C	17	17
United Wall Paper	2⅛	2
Same Preferred	17¼	*16½-17¼
U. S. Gypsum	176	183
Same Preferred	181	178½
West Va. P & P	33¾	35
Same Preferred	106¼	105¼

New York Stock Exchange — Bonds

Celotex 5¼%	...	...
Champion P&F Co. 3%	...	...
Mead Corp.	...	10

American Stock Exchange — Stocks

American Writing	16	16
Brown Company Common	16⅞	14¼ 10
Same $5 Preferred	118½	106¼
Same $2 Preferred	52	53 10
Puget Sound	40	39⅜

*Closing Bid and Asked Prices

NATURE
sows the seed

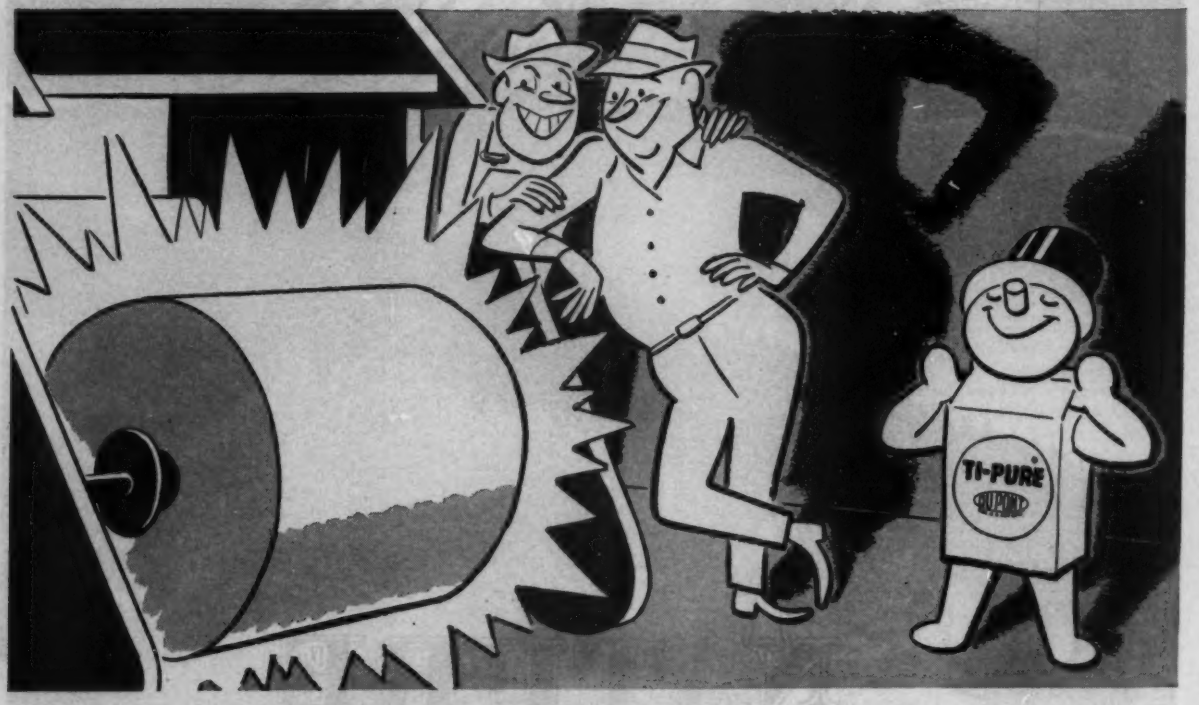
Natural reforestation on Weyerhaeuser Timber Lands is achieved with seed supplied from blocks of trees reserved during logging and left standing to re-seed the adjacent cut-over area. This is a basic principle of Tree Farming.

Weyerhaeuser forest lands, consisting of eleven Tree Farms, are *cultivated* scientifically and intensively in line with the best possible forestry practices. Reforestation keeps pace with harvesting. Re-seeding of cut-over land *now* assures a timber crop that is sufficient and continuous.

Researchers are each day finding new uses for woodpulp. A full supply from Weyerhaeuser Tree Farms will *always* be available as a result of planned timber crops and a helping hand from Weyerhaeuser foresters.

WEYERHAEUSER

"Radiant smiles are a common sight Since **Ti-Pure**® made their paper bright!"



Mill owner Moffit was feeling quite weary,
"There's simply no profit in paper that's dreary!
What filler will give me the brightness I want?"
When onto the scene stepped TI-PURE of DU PONT.

"Moffit," said TI-PURE, "you really should see
How I can make paper as bright as can be.
I'm a tried and true pigment, a real thoroughbred;
With me in your beater, you'll be out of the red!"

So Moffitt used TI-PURE in his next batch of paper,
With such brilliant results, he started to caper.

MORAL:

Why you should use TI-PURE is quite plain to see:
It gives whiteness... and brightness... and opacity!

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WHITENESS. Lasting whiteness in food wraps and containers, waxed board, glassine, and parchment.

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OPACITY. No "show-through" in lightweight papers, envelope and stationery stock.

FIRST OF FOUR patented Beloit Air-cushioned Inlets which are now in operation at Consolidated Water Power & Paper Company. Stock level inside is automatically held constant at all machine speeds. Self-cleaning rectifier rolls and controlled approach flow help to produce a level, high-quality sheet of uniform caliper.—*Beloit Iron Works, Beloit, Wisconsin.*

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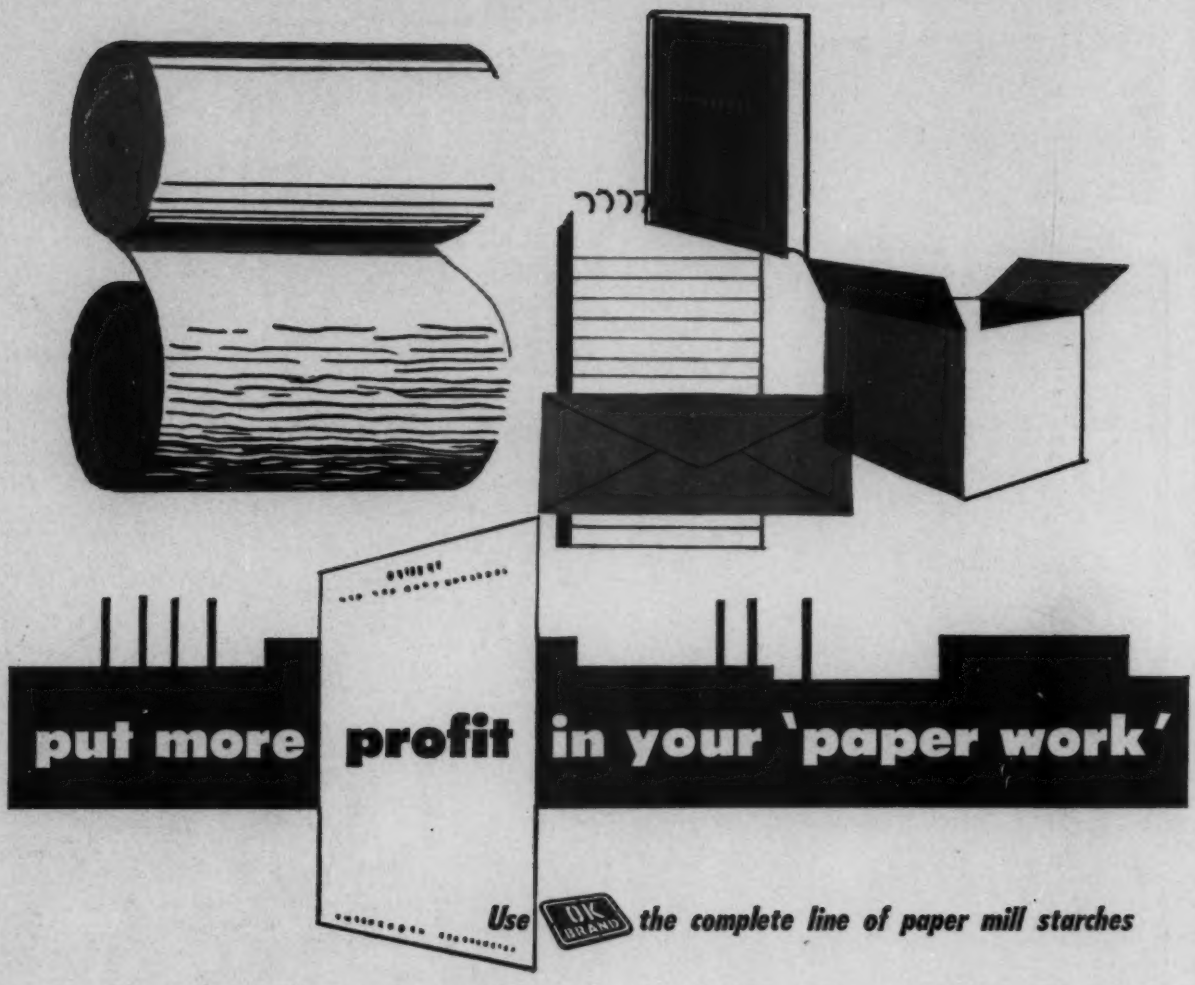

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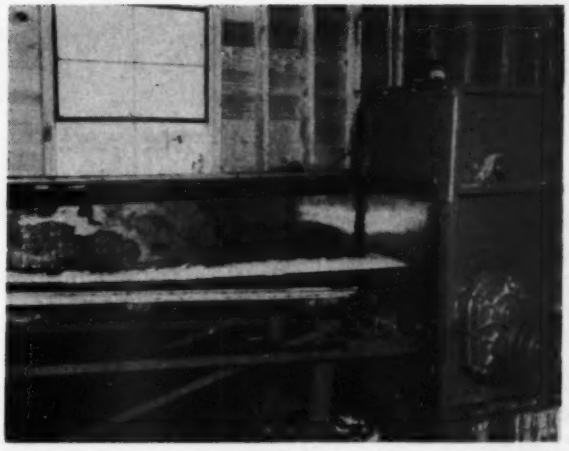
NEWS of the INDUSTRY

SLAB CONCENTRATION yard showing slabs waiting for transfer to debarker and chipper. Slabs so stacked can be handled by lift truck



CLEAN SLABS emerge from the outfeed side of the debarker after bark has been removed by jets of water at 900 psi. Capacity is 5 cords per hour

BARK-FREE slabs are hauled by truck from the Andersson barker at the Grayson plant. They bypass the debarker to go directly to the chipper

FEEDING THE CHIPPER by conveyor is a one-man operation. Slabs on right come from debarking machine, those at left from Grayson

South's First Slab Concentration Yard in Operation in Alabama

WHOLESALE RECOVERY of pulpwood chips from both large and small mill slabs is promised by the successful operation of the South's first "slab concentration yard" at Decatur, Ala. The "yard" is the project of Clancy Forest Products Inc.

Heart of the new plant is a hydraulic slab debarker designed by Leon Clancy, president of the firm, and constructed by Jackson Industries of Birmingham.

"The efficiency of the machine," according to Mr. Clancy, "enables us to pay $8 a cord for barky slabs and edgings delivered to our yard. That's sufficient incentive for mills as much as 75 miles away to offer us their full production of pine slabs. Available slab supply will more than meet the needs of our weekly production of 500 cords of chips."

The Clancy-designed slab debarker features two major differences from previously available equipment:

Its three 900-psi water jets strike the barky surface of the slabs at a 30-degree angle, producing slabs that are absolutely bark-free—even around knots—with no damage to the wood itself. Heretofore, jets have been di-

BARK-COVERED SLABS are fed into one end of the debarking machine invented by Leon Clancy, president of Clancy Forest Products

FIRST BARGE being loaded with chips made from slabs and edgings. Clancy Forest Products supplies chips to Bowaters Southern

rected at a 90-degree angle, resulting in considerable wood damage and relative loss of fiber.

Considerably lower investment

A second feature of the equipment is powerful hold-downs that hold slabs in a steady position while passing through the force of the jets. This, too, prevents wood destruction and increases the removal efficiency.

The Clancy unit, costing about $20,000, also represents a considerably lower investment than required by equipment previously available.

Mr. Clancy is making the unit available to the industry, and already other firms are considering the installation of concentration yards. According to Edward De Motte, district manager for American Forest Products Industries Inc., "it isn't inconceivable that some day every mill in the South will be within reach of a slab processing point."

At a recovery rate of one-half cord of chips per 1000 ft. of lumber, such a millenium in this new field of conservation could theoretically provide for a 40 per cent reduction in the region's annual pulpwood cut or, conversely, a corresponding expansion in the paper industry without additional drain on the forests. In addition, it affords sawmills a means of recovering some $3 or more per thousand on stumpage costs.

Andersson debarker at Grayson

In addition to purchased slabs, Clancy Forest Products also utilizes bark-free slabs hauled from Clancy Lumber Co. in Grayson, a subsidiary.

A new model Andersson log debarker has recently been installed at the latter plant. Its daily yield is 20 to 25 cords of clean slabs. The layout of the Decatur plant provides for direct feed of these slabs to the chipper and screen, bypassing the new debarker. The chipper has somewhat greater capacity than the 5 cords per hour delivered to it from the slab debarker.

The Swedish log debarker at Grayson features a 50 per cent increase in weight over older models and also has eight plungers instead of four for removal of bark.

Debarking and chipping aren't the only intriguing aspects of the Clancy operations.

3000 cords to Bowaters

The firm recently entered the transportation business by constructing its own port facilities. Included are a 100- by 1000-ft. harbor, a mile-long sidetrack, an automatic steam boiler for steaming and pumping oil barges, and a 1-yd. heavy-duty crane equipped with a Blaw-Knox Co. pulpwood grapple and a 45-in. electro lifting magnet for handling pig iron and scrap.

A contract with Bowaters Southern Paper Corp. at Calhoun, Tenn., provides an outlet for 1000 cords of pulpwood and 2000 cords of chips per month.

The Bowaters contract provides only for pine chips and wood, but officials of Clancy Forest Products anticipate markets for hardwoods as well.

Canada's Largest Tissue Machine Highlights Multi-Million Dollar Mill

CANADA'S LARGEST TISSUE machine recently went into operation at the E. B. Eddy Co.'s new Lower Hull, Que. mill. The over-all cost of the expansion project was $4,500,000.

The giant Yankee machine was designed for a maximum speed of 2500 fpm. It was built by Beloit Iron Works over a period of approximately 15 months. According to E. B. Eddy, the daily output (about 2290 cases) would "reach half way around the world."

Housed in a modern tile building across the Ottawa River from Canada's parliament buildings, No. 3 is the latest advance in the firm's 100-year history. Feature of the machine installation is the 45-ton drying cylinder.

Higher quality, more uniformity

Company officials declare that the new machine will result in the manufacture of "even higher quality and more uniform tissue" than has been turned out in the past. Cost of the machine was $1,000,000, while that of the machine building was $800,000.

Machine width at the breast roll is 149 in., giving a 140½-in. roll at the reel. On the winder the roll from the reel is trimmed into two rolls each 69¼in. in width—the width of the fully automatic rewinders in the converting department. On these rewinders a further trim is taken off in producing sixteen 4½-in. toilet rolls.

Designed for a 2500-fpm maximum, the unit can be driven by the Reliance electric drive at 2200 fpm. With minor modifications to the drive, this speed can be increased to 2400 fpm.

Pulp supply

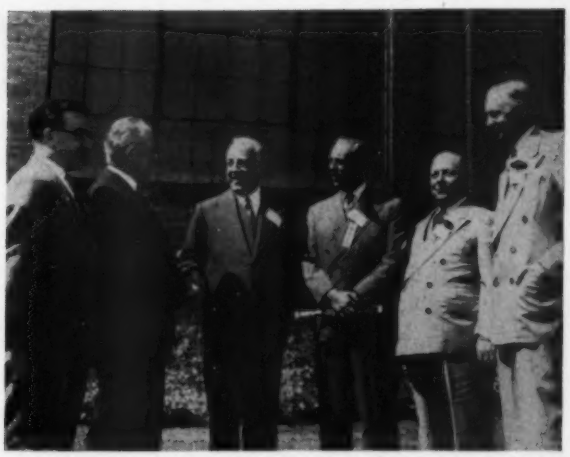
Unbleached groundwood is available in slush form from the Hull groundwood mill. Unbleached and bleached sulfite are supplied in slush form directly from the lower sulfite mill. All pulps can also be supplied and handled in lapped form—necessary in those tissue grades using both bleached poplar sulfite and bleached spruce sulfite.

All three pulp grades are stored at approximately 3-per cent consistency and are pumped into tile-lined metering tanks located on the mezzanine floor above the pulper. The latter unit is gravity-fed in measured quantities.

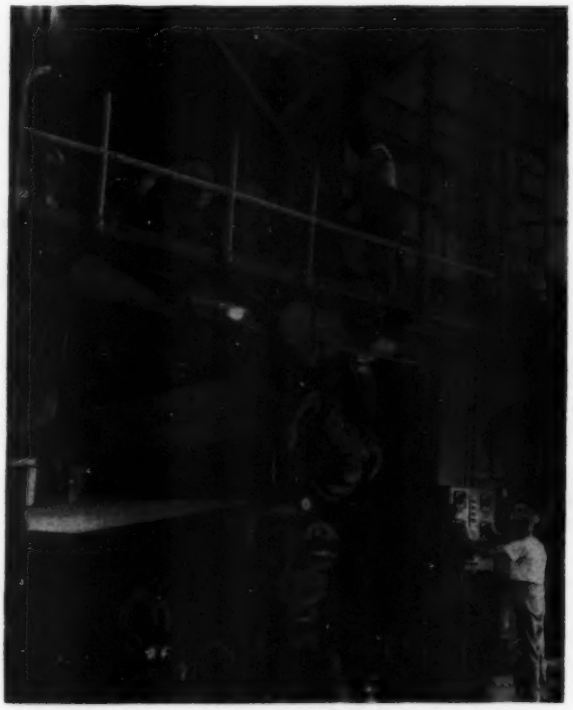
Following mixing and the disintegration of any laps, the pulp is pumped into a tile-lined chest, from which in turn it is pumped to the blending chest for the addition of stock from the saveall.

Paper machine broke, together with

NEW TISSUE MACHINE at the E. B. Eddy Co. mill in Hull, Que., produces tissue at the rate of 229,000 rolls daily. Machine was formally dedicated late in August, when the public toured the new $4,500,000 mill on the banks of the Ottawa River



DIGNITARIES AT the dedication: A. Welch, vice president; R. A. Robertson, president; Alexandre Taché, speaker of the Quebec legislature; Garfield Weston, board chairman; Romeo Lorrain, Quebec public works minister, and R. M. Fowler, CPPA president



DRYING SECTION at the Hull mill. Huge 45-ton Yankee dryer 12 ft. in diameter identifies machine as designed for tissue

WINDERMAN AT the winder controls of Eddy's new machine. Glazed tile of machine room walls helps maintain cleanliness

trim and broke from the converting department, is disintegrated in a Liebeck broke pulper located under the dry end of the machine. From this pulper the broke goes first to the broke storage chest, then at a constant rate into the machine chest.

Paper machine

Featuring a pressure head box, the paper machine has a fourdrinier section equipped with dandy type table rolls immediately following the breast roll.

The Yankee dryer is steam heated and has a surface temperature of approximately 240°F.

No. 3's calender stack consists of three pairs of rolls: the top pair chilled iron against rubber, the second an engraved steel roll with fine crepe design against rubber, and the bottom two plain chilled iron rolls. The pressure between each pair is controlled pneumatically and is varied according to the tissue being made.

The machine is equipped with a J. O. Ross ventilation system that reuses the heat given off by the dryer. In addition, special equipment has been installed to dispose of the dust created by the soft tissue at both the calender stack and the winder.

Converting department

The converting department has been entirely modernized by the modification of existing buildings to provide for the installation of new equip-

TWO OF SIX 30-ft. heating elements designed and engineered for the Champion Paper & Fibre Co. plant in Canton, N. C. When erected, the unit will evaporate about 500,000 lb. of water per hour in the recovery system of the kraft paper mill. The evaporator was designed and supplied by Goslin-Birmingham Mfg. Co.

ment. Three fully automatic roll tissue winders trimming 68 in., each operating with a Lawtomatic roll wrapper; one 17- by 17-in. napkin folder, and a complete new conveyor layout with one fully automatic and one semi-automatic case sealing machine comprise the principal items of equipment. In addition, a unit for plying tissue into two- and three-ply is being installed.

By the modification of existing buildings, a roll storage area has been provided immediately below the converting department. Capacity is nearly 1000 tons of jumbo rolls of tissue and towelling. In addition, adequate storage space has been provided for cases, wrappers and other manufacturing materials.

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New Fourdrinier Highlights Multi-Million Dollar Expansion at Lee Paper

Plans for a $1,500,000 expansion program—to include the installation of a new fourdrinier paper machine—have been announced by Lee Paper Co. of Vicksburg, Mich. The contract for the construction of a two-story finishing room extension was let recently, with work to start in October.

The paper machine has been ordered from Beloit Iron Works. Its cost will make up the major part of the total expenditure. The exact amount is uncertain, company officials said, pending design changes. It will be approximately 175 ft. in length.

It is believed that the machine will be the first fourdrinier installed in the Kalamazoo Valley for making fine paper in the last three decades—except for a similar one put in by Lee in 1951. The present unit will replace No. 1, one of the two original fourdriniers installed when the mill was built in 1904.

Also included in the improvement program are plans to construct a new beater room building to house stock preparation equipment for the new machine. The finishing room addition will measure approximately 72 by 150 ft.

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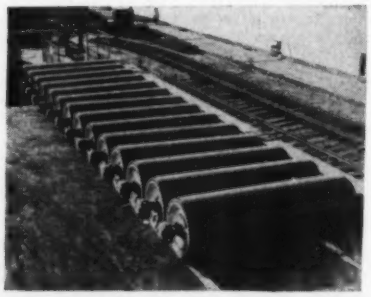
Rome Kraft Operation at New Georgia Mill Starts

Rome Kraft Co. was to begin operation of its new $25,000,000 kraft containerboard mill during the late summer. Located just west of Rome, Ga., the plant is owned jointly by the Mead



NEW HIGH-PRESSURE dryers awaiting shipment to the Madawaska, Maine mill of Fraser Paper Ltd.; the 60-in. diameter, 192-in. face units will be installed on the firm's new Pusey & Jones Corp. fourdrinier

News of the Industry . . .

Corp. and Inland Container Corp. and will have an annual capacity of more than 200,000 tons.

The announcement was made by Herbert A. Kidd, vice president and general manager, who also reported on the make-up of the supervisory staff. Some of the supervisors have been transferred to Rome from other Mead plants, while the balance are local men. Mr. Kidd, a native of Scotland, joined Mead in 1929. Until his present appointment, he was manager at Macon Kraft Co., a sister plant.

Top assistant to Mr. Kidd is Lawrence C. Crowder, general superintendent, transferred from Macon. Other principal staff members are: E. V. McSwinney, assistant controller; Robert J. Kelly, industrial relations manager; D. F. Black, assistant industrial relations manager; Ralph J. Schmieder, purchasing agent; Marvin O. Small, senior accountant and office manager; Marvin J. Jones, supervisor of safety; Anthony J. Parrino, paper mill superintendent; James A. Whelan, pulp mill superintendent; James Fister Quinn, in charge of wood yard operations, and George W. Reynolds, plant engineer.

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International May Acquire Brown Co. Canadian Property

Persistent rumors that Brown Co. is considering the sale of some of its Canadian properties to International Paper Co. were recently confirmed.

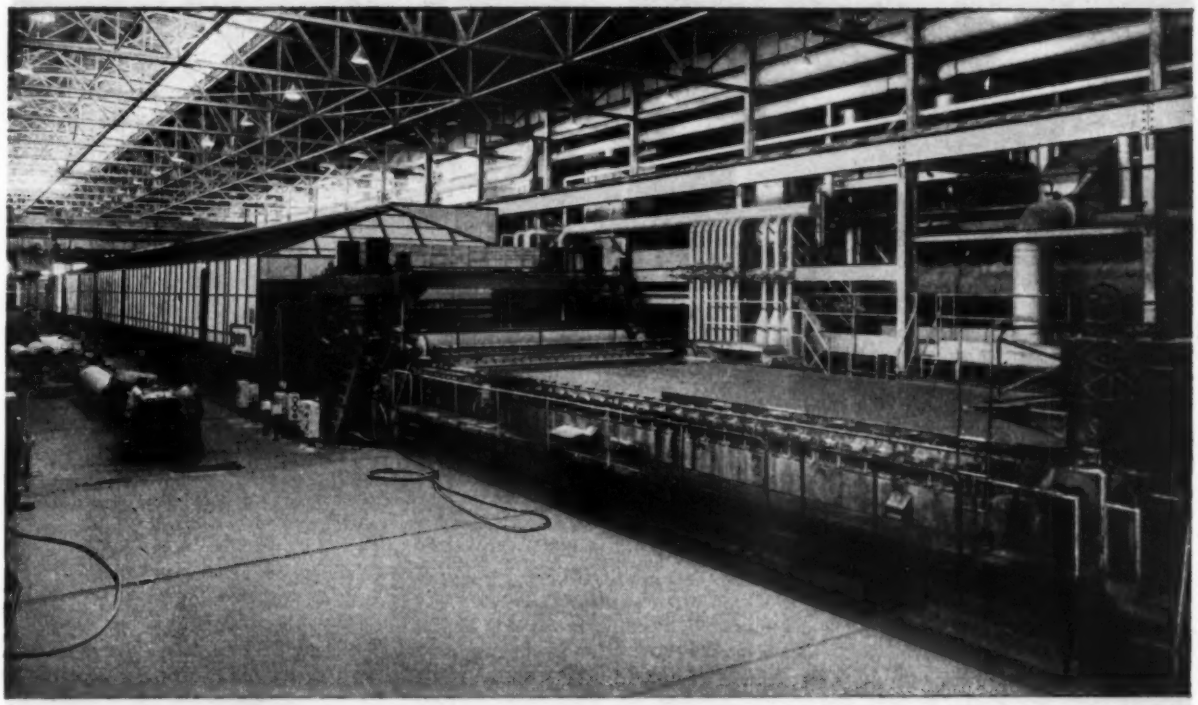
President Laurence F. Whittemore declared that sale of certain properties had been discussed, but that nothing had been decided as yet. He failed to disclose the properties that might be involved but declared that none in the United States would be included in any sale. He added that no merger of Brown into International is planned.

Properties of the firm's Canadian subsidiary, Brown Corp., include a bleached and unbleached kraft pulp mill at La Tuque, Que.; 809,000 acres of freehold timberland; timber limits of 1,694,000 acres under lease from the provincial government, and a half interest in the 222,500-hp plant of St. Maurice Power Corp.

International's operations in Canada at present include no kraft pulp capacity. Such operations are directed by its subsidiary, Canadian International Paper Co.

(Turn to Page 690)

Union Bag with Puseyjones Machines



New No. 6 Puseyjones Fourdrinier Machine at Union Bag and Paper Co., Savannah, Ga. Fourdrinier is of Rapi-Drape construction for 120-foot wire; Press Part of Simplex design with two suction presses; Dry Part comprises 71-60" paper dryers and 16 felt dryers, with intermediate smoothing-marking press and size press; eight roll calender stack; Puseyjones horizontal track reel for 96" rolls. A General Electric multiple generator electronic-controlled sectional drive provides power for the various machine sections.

Sets World Production Record

There's a new world's record for production of Kraft paper and liner—a daily average of 1,801 tons for 30 days, and a high of 2,163 tons for a single day! That's the record set at the Savannah, Ga., plant of Union Bag and Paper Corporation, after its large expansion program "A" had increased to six the number of Puseyjones Fourdrinier machines.

All six Puseyjones machines are of 236" wire width. Unit No. 6 is designed for a speed of 2,000 feet per minute, and has all modern improvements including a winder built for speeds up to 6,000 feet per minute.

If you plan to rebuild for higher speed, increased production, reduced maintenance costs, or a greater range of high grade products, get the benefit of Puseyjones' experience. Our district representatives are factory-trained engineers, ready and well-equipped to help you on any machine problem. Call the representative nearest to you, or write us today.

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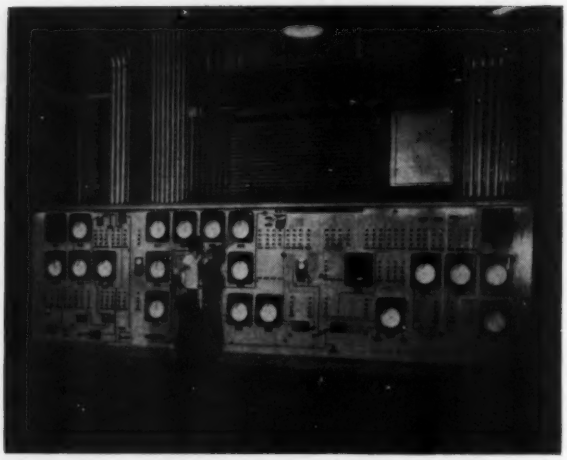
Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products
Wilmington 99, Delaware, U.S.A.

NEW FOURDRINIER paperboard machine installed by Alton Box Board for the manufacture of Cor-U-Cel. A new type of corrugating medium made from wheat straw, the product is used as the fluted center section of corrugated paperboard



FROM ONE PANEL technicians control the precise processing, pulping, washing and refining of wheat straw used in the manufacture of Cor-U-Cel. Its development is the result of years of research and gives straw a new importance as a raw material

New Corrugating Medium Developed by Alton Box; Fourdrinier Installed

STRAW FIBER HAS been given a greater importance as a paperboard raw material with the development of a new corrugating medium by Alton Box Board Co., Alton, Ill.

Although the new medium has been manufactured for more than a year, official announcement was deferred until the board had been thoroughly tested in actual use.

As a part of the development program, the firm's No. 3 machine was replaced with a larger high-speed Beloit fourdrinier unit. Although the original was a comparatively new cylinder machine, Alton Box Board wanted the more-than-double capacity of its replacement.

Meets problem of shortage

Marvin W. Swaim, first vice president and general manager, noted that paperboard has been made from wheat straw for many years. "But never before," he said, "has the industry utilized straw fiber in the production of such a superior board." Known as "Cor-U-Cel," the new medium is manufactured by a process developed by Alton Box.

Mr. Swaim said that the development has a further significance in that it "licks a problem which industry statisticians had predicted would become acute — a shortage of fibrous raw material. Cor-U-Cel shows that annual crop fiber can be used to manufacture board of the highest quality."

In a lengthy research program, Alton Box Board chemists determined that the all-important ability of a corrugating medium to resist crushing is controlled largely by the amount of pentosans it contains. If they can be retained in the fiber throughout the digesting and refining process, they help to rebond the fibers in the finished corrugating material.

The chemists next confirmed the fact that wheat straw contains far more pentosans than any other fibrous material economically feasible for paperboard. Their problem, therefore, was to develop a system for treating straw that would retain these valuable adhesives.

Following success on a laboratory scale, a pilot project was undertaken. The new system yielded straw pulp unusually high in pentosan content.

A major rebuilding

The next step was a complete rebuilding of the firm's straw processing, pulping and refining equipment and its No. 3 machine. Included was construction of processing equipment making extensive use of the newest types of conveyors and controls, so that the entire operation could be handled with precision.

A hammermill was erected to cut the straw to uniform size; a cyclone to give it its first cleaning with a blast of air; and storage bins to keep the pulp mill supplied with a uniform supply of clean, chopped straw. All components were connected with pushbotton-controlled conveyors incorporating automatic weighing devices.

Then followed conversion of the firm's digester house to an up-to-date pulp mill and the installation of new washing and refining equipment.

With completion of the new machine installation about a year ago, production in the experiment began. Straw began to move through the processing plant, the digesters and the new refining equipment to the head box of No. 3. Off the dry end came the new corrugating medium.

According to Mr. Swaim, Alton's "faith in annual crop fiber has been completely justified. We feel that such fiber holds great promise in view of the inevitable fiber shortage that statisticians predict for our growing industry. Furthermore, we feel that the potential of straw fiber is far from exhausted. We are continuing our research along these lines."

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Schundler Announces New Joliet Board Plant

F. E. Schundler & Co. has announced plans for the construction of a Perlite insulation board plant in Joliet, Ill. According to J. C. Kingsbury, vice president, the board is composed principally of Perlite and is a research development of the Schundler laboratories.

Present plans call for an output of 50,000 sq. ft. of 1-in. board per 24

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hours. However, the mill has been designed for a possible capacity of 100,000 sq. ft. Engineers for the project are Johnson & Johnson of Chicago.

As announced by the company, the board "culminates a long search for a mineral insulation in rigid board form. Both standard and acoustical board in thicknesses from ¼ to 2 in. will be produced."

The complete stock preparation system and the board machine will be built by Downingtown Mfg. Co. of Downingtown, Pa. Equipment for the drying section will be supplied by Coe Mfg. Co. of Painesville, Ohio.

Stock will be prepared in a Downingtown Fibrepulper, and the board will be formed on a 105-in. specially designed fourdrinier. It is said that a unique feature of the installation will be a welded steel blow box positioned inside the top wire just before the caliper press and just over the second of two Rotabelts. The blow box is expected to improve operation by heating the water in the sheet for more complete removal.

Drying equipment will include a Coe board dryer and wet saw.

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H & W-Scott Merger OKd

Directors of Hollingsworth & Whitney Co. in Boston have approved a proposed merger with Scott Paper Co. According to the firm, a special meeting of Scott directors at Chester, Pa., has also approved the plan.

The proposal calls for 1.4 shares of Scott common to be issued for each share of H&W. The plan is subject to approval by shareholders of both firms at October 26 meetings.

H&W operates plants at Winslow and Madison, Maine, and Mobile, Ala. The acquisition proposal calls for the enlarging of production facilities at each of the three locations.

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Chemical Paper Sells Machine

Chemical Paper Mfg. Co. of Holyoke, Mass., has dismantled its No. 2 machine to make way for the new fourdrinier that it now has on order. No. 2 was one of the original units installed in 1880.

The old fourdrinier, which has a speed of 250 fpm and trims at 84 in., has been sold to a pulp firm in Bloomington, Ill., where it will be used for the preparation of cotton linter.

The 130-in. fourdrinier that will be installed is to be supplied by the Bagley & Sewall Co. of Watertown, N. Y. It will be capable of speeds of up to 900 fpm. and have an 80-in. wire.

NEW ZEALAND'S FIRST newsprint mill under construction for Tasman Pulp & Paper Co. Ltd. of Auckland. Located at Kawerau, the mill will have an annual capacity of 75,000 tons of newsprint and 37,000 tons of unbleached sulfate pulp; an adjoining sawmill will produce 72,000,000 bd. ft. yearly. The above view shows Mt. Edgecumbe in the background, stores building to the left, mill and administration building in the center and the pulp dryer room at the right. The project is being designed and constructed by Merritt-Chapman & Scott Ovearseas Inc. and Raymond Concrete Pile Co., both of New York, N. Y., and Fletcher Construction Co. Ltd. of Auckland

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Eight Mills Scheduled to Complete Precipitator Installations This Year

Research Corp. of Bound Brook, N. J., has reported that during 1954 eight pulp and paper mills will have installed RC equipment with a total gas cleaning capacity of 1,608,000 cfm.

These new installations will bring the total volume of gas cleaned by Research Corp. Cottrell electrostatic pricipitators since 1940 to 10,073,000 cfm. According to the firm, the total volume of salt cake recovered is more than 3,750,000 tons, equal to a dollar value of approximately $75,000, 000.

The 1954 installations are being made by St. Joe Paper Co., Port St. Joe, Fla., Gaylord Container Corp., Bogalusa, La; Longview Fibre Co., Longview, Wash.; National Container Corp., Valdosta, Ga.; Rome Kraft Co., Rome, Ga.; Rayonier Inc., Buckeye Cellulose Corp., Foley, Fla., and Continental Can Co., Hopewell, Va.

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Southland Awards Contract for Newsprint Machine

Southland Paper Mills Inc. of Lufkin, Texas, the South's pioneer newsprint mill, has announced the awarding of a contract for the construction of its new No. 3 newsprint machine to the Pusey & Jones Corp. of Wilmington, Del. Delivery is scheduled for early 1956.

The unit will be of the latest high-speed design and construction, will have a wire width of 210 in. and be equipped with vacuum pick-up attachment. The maximum speed will be 2000 fpm.

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Expansion Notes

Celotex Corp. will construct a gypsum board mill and expand its present facilities in Port Clinton, Ohio. Cost of the project, which will double the present capacity, has been estimated at $3,000'000.

International Paper Co. is spend-

ing $2,000,000 in the expansion of its pulp and paper plant at Bastrop, La. The project will increase the mill's capacity for sulfate pulp and paper by a daily 25 tons.

The Ohio Paper Co. of Miamisburg has acquired Southern Asphalt Roofing Co. at Little Rock, Ark., manufacturer of asphalt shingles, roll roofing and saturated felt. The Ohio company also reported an expansion program for its Miamisburg plant that will increase the present output from 70 to 100 tons per day.

The Panelyte Div. of **St. Regis Paper Co.** has announced its entry into the vacuum forming field at Richmond, Ind. According to C. Russell Mahaney, St. Regis vice president and general manager of the Panelyte Div., the recent development of methods for producing satisfactory gloss surfaces on high-impact polystyrene sheet has been important to the vacuum forming industry, with parts so formed now acceptable in a wide variety of applications where appearance is an important factor.

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Pulp, Paper Ranks Low in Fringe Benefits

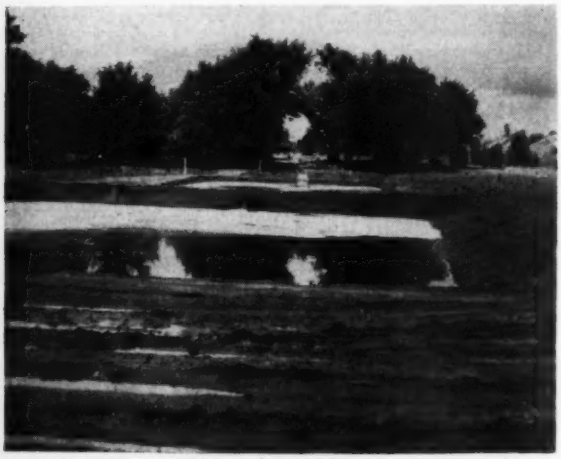
Final reports in a nation-wide survey reveal that fringe benefit costs—employer payments for social security, pensions, vacations and the like—amounted to $720 per employee during 1953. According to the Chamber of Commerce of the United States, by whom the survey was made, the figure was $76 higher than that obtained in a similar study two years ago.

By industries, the average payment ranged from 14.3 per cent for pulp, paper, lumber and furniture to 28.7 per cent for banks, finance and trust companies.

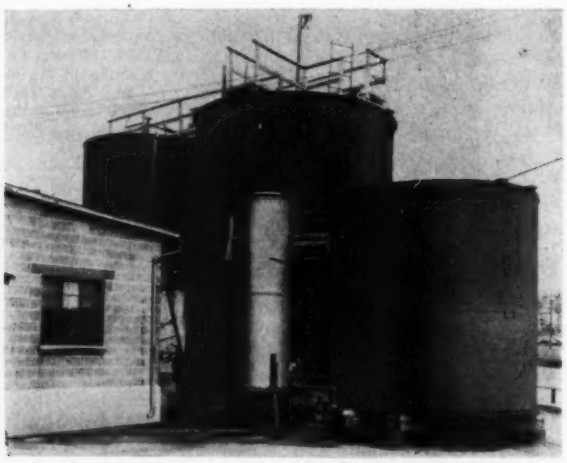
More than 97 per cent of the firms reported payments for employee insurance programs, with payments averaging 1.8 per cent of payroll. Payments for pensions were reported by 81 per cent of the companies, with payments averaging 4.7 per cent of the payroll.

Fringe payments varied widely, ranging from less than 5 per cent to more than 55 per cent of payroll. The median payment was 19.2 per cent of payroll, 34.6 cents per payroll hour.

Dr. Emerson P. Schmidt, director of the Chamber's Economic Research Department, explained that it is impossible to calculate the total cost of fringe benefits to business, adding that "it runs into the many, many billions. Possibly the annual cost is somewhere between $20 and $25 billion."



AT MARATHON—Soil filtration ponding project under construction at the Rothschild, Wis. plant of Marathon Corp.; the $50,000 construction utilized 3000 ft. of welded stainless steel tubing and fittings, which will carry a daily 100,000 gal. of effluent from the sulfite mill and chemical plant



AT WESTVACO—Pilot plant at the Covington, W. Va. mill of West Virginia Pulp & Paper Co., where recently adopted waste treatment process was developed. Based on bacterial action, the plant is the first of its kind in the world. (See THE PAPER INDUSTRY for August)

Anti-Pollution Measures Studied in Wisconsin River Survey

AN INTENSIVE SURVEY of the Wisconsin River to help determine the effectiveness of recent anti-pollution measures has been completed by Consolidated Water Power & Paper Co. and Nekoosa-Edwards Paper Co. The two-week project was under the joint direction of G. K. Dickerman, Consolidated's technical director, and Dr. T. A. Pasco, research director for Nepco.

Chemical studies of river water from scores of locations were made by a team of five chemists from the Sulphite Pulp Manufacturers Research League. Biological aspects of the stream were studied by two experts from the Institute of Paper Chemistry. Aiding in the work were staff members of both paper firms.

Consolidated and Nepco have both started pollution abatement measures, and the surveys will determine their effectiveness. Dr. Pasco estimated that it will be mid-autumn before the scientists arrive at conclusions.

Meanwhile, Consolidated has submitted to the Wisconsin State Committee on Water Pollution its plan to construct a 4-in. stainless steel pipeline 7100 ft. in length as its latest step in combatting the sulfite pollution of the river. The project would cost an estimated $50,000.

The pipeline, with a daily capacity of 200,000 gal., would extend from Consolidated's Wisconsin Rapids plant to an island in the river. A lagoon of the seepage or soil filtration type will be constructed on the island. Upon completion of the project, all collectible sulfite liquor solids will be pumped to the area with the exception of the amount needed to continue

for maximum process stability and economy

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distribution of the liquor for roadbinder purposes.

Dalton studies under way

G. D. Kittredge, plant engineer, has described the experimental waste disposal plant that will be built by Crane & Co. at Dalton, Mass.:

"Effluent from two of our mills will be pumped to three experimental settling basins—two of which are 100 by 200 ft., while the third is 40 by 100 ft. Studies of solids removal and b. o. d. reduction will be made at these basins in an effort to determine the most satisfactory method of handling our particular wastes.

"It is hoped that experience gained from this will provide the necessary information to construct a larger treatment plant for the wastes of the entire company."

Progress in Wisconsin

Two Wisconsin pulp and paper manufacturers have announced projects to increase their capacity to handle spent sulfite liquor.

Rhinelander Paper Co. has reported that additional capacity for the manufacture of dried torula yeast from the spent liquor has gone into production at its subsidiary, Lake States Yeast Corp.

Until the present expansion, the maximum daily capacity was restricted to 11,500 lb. of dried yeast. A building addition and a high-capacity double drum dryer have now been added to open the production bottleneck and increase daily output by more than 10 per cent.

Consolidated Water Power & Paper Co. has installed a new double drum dryer at its Interlake mill in Appleton. The unit processes the syrupy sulfite concentrate from the mill's big evaporators, producing a dry flaky material that goes to some customers in this form, while for others it is powdered in a hammermill.

The spent liquor as collected from Interlake's nine digesters contains about 12 per cent sulfite solids. The evaporators concentrate it to 50 per cent solids, boiling it down to about one-sixth its original bulk. Substantial fractions of the 30,000 to 50,000 gal. of concentrate produced daily are now being sold in the syrupy form for use in making linoleum paste, roadbinder, etc.

•

Pentagon to Use Pulper and Wet Machine for Disposal of Secret Papers

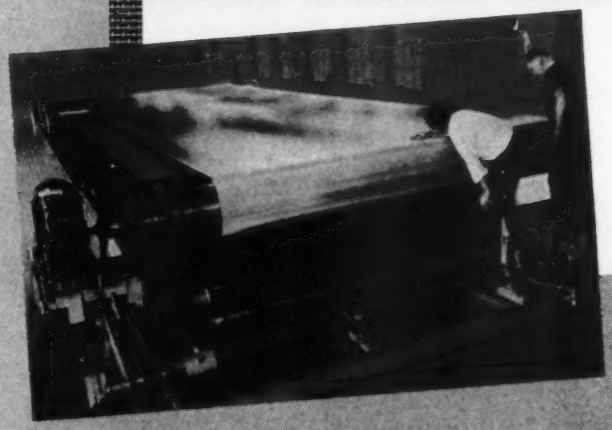
Downingtown Mfg. Co. of Downingtown, Pa., has contracted to build a pulper and wet machine for installation at the Pentagon Building in Washington, D. C. The units will be used to destroy secret government documents by converting them into sheet pulp. At the present time such papers are burned.

Pulping equipment had previously been used on a small scale, but disposal of the wet pulp was a problem. For that reason, Dowingtown engineers recommended the use of a wet machine for conversion of the pulp into sheets.

The new pulper has been designed to disintegrate and defiber approximately 2000 lb. of waste paper per hour and will utilize a 75 hp motor. Stock will be extracted continuously through plates perforated with 1/4-in. diameter holes. A pulsating diaphragm behind the plates will improve stock flow.

The pulper will be equipped with a 42-in. diameter rotor with removable blade segments, and the entire rotor assembly will be mounted directly on an extended shaft from the drive gear motor.

Two of the Men Behind Eastwood Wires



FINAL EXAM

Here James Baney and Clarence Reed are making a final, inch-by-inch examination of a large fourdrinier wire. Though this is a final check, it is only one of many given it at every stage of its manufacture, from the casting of the alloys in our own foundry to the stretching table inspection shown above.

Because the Eastwood-Nealley plant is a *completely integrated* operation, every wire we ship has undergone thorough and continual analysis, control and testing from the raw metals to your finished fourdrinier wire ready for quality paper production.

We are proud to say they are *truly ours* — "from ingots to fourdrinier wire".

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

The wet machine will have a 72-in. face, 42-in. diameter cylinder mold, and a rubber-covered top roll. The sheet will be carried by a felt over a suction box to a forming and dewatering press. The sheets will measure approximately 95⅝ in. by 68 in. The machine has been designed to produce approximately 24 tons of pulp per day.

•

Sec. Mitchell Prohibits Work by Minors on Paper Products Equipment

According to a hazardous occupation order issued recently by Secretary of Labor James P. Mitchell, boys and girls under 18 years of age are prohibited from operating 14 various types of power-driven paper products machines.

In application, the order will cut across industry lines, applying wherever such machines are used. According to Secretary Mitchell, a substantial proportion of some 5,000 to 6,000 minors under 18 who are working in plants producing converted paper products perform tasks involving these machines; also, that young people are known to be working at these machines in such businesses as job printing shops, bookbinderies, stationers, etc.

The prohibited jobs will include the operation of, or assisting in the operation of, the following machines: arm-type wire stitcher or stapler, circular or band saw, corner cutter or mitering machine, corrugating and single- or double-facing machine, envelope die-cutting press, guillotine paper cutter or shear, horizontal bar scorer, laminating or combining machine, sheeting machine, scrap paper baler, or vertical slotter.

Also included is the occupation of operating or assisting to operate any platen die-cutting press, platen printing press, or punch press that involves hand-feeding.

•

Wisconsin Timber and Pulpwood Market "Soft"

A survey recently completed by the Wisconsin Conservation Commission shows that the market for timber and pulpwood currently being harvested in that state is "soft." Market conditions, according to the report, may worsen.

The state agency surveyed wood markets in preparation for the annual revision of its severance tax schedule used in the administration of the forest crop law.

The commission declared that there is today virtually no market for some timber products, including some species of pulpwood, and that in others prices are down. The survey found that the current market for aspen and pine pulpwood is poor, and that prices may drop further during the next year.

•

1516 Foresters Employed by U. S. Pulp Companies

Pulp firms in the United States now employ 1516 graduate foresters, an average of nine for each of the 171 companies using pulpwood. This according to a recent survey made by the American Pulpwood Association.

Looking for a Job?
See Classifieds, page 747

More than half of the 1516 are engaged in forest management work. This group of 868 professional foresters compares with the 263 so engaged just seven years ago.

According to W. S. Bromley, executive secretary of APA, pulp firms' employment of professional foresters for management of woodlands in-

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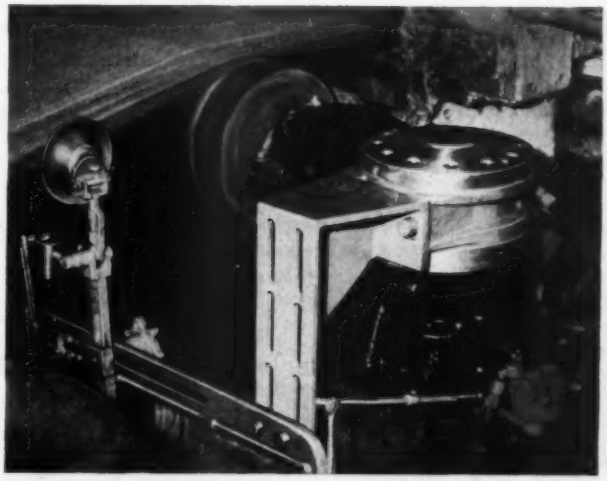


teaching a wire to toe the line...

It's model 706, new Gilbert & Nash Hydra Guide with rotary palm* for wire, wet felt, and dryer felt service. Shown in actual use—now in its second year—at Sorg Paper Company, Middletown, Ohio, #6 machine, Smith mill.

High speed machines—even variable speed machines—are no handicap to model 706. Its guide roll moves only in a *horizontal* plane to avoid undue wire stretch . . . continuously corrects at a plus or minus 1/64 inch . . . eliminates over-correction or hunting.

Hydraulically operated by water pressure—where filtered water pressure is 40 to 60 lbs.—or by oil pressure with a pump of one gallon per minute capacity. Send for free Hydra Guide folder or, at no obligation, write for a Gilbert & Nash representative to call at your mill.

GILBERT and NASH APPLETON, WISCONSIN

*Manufactured and sold exclusively by The Appleton Machine Company

creased 300 per cent between 1945 and 1952. "Actually," he declared, "pulp companies have more than 1516 graduate foresters on their 1954 payrolls. The postwar pace in hiring such men continued beyond the base year of our study . . . . The 1516 are part of the 6200 privately employed foresters in the country. . . ."

In addition to the 868 employed in forest management, 256 are assigned to timber procurement, 134 to logging, 54 to research, and 204 to various other categories of forestry work.

South in the lead

Pulp companies in the South are far in the lead in the employment of graduate foresters, having 825 of the 1516-total. The numbers in other regions are: West, 332; Northeast, 193; Lake States, 140, and Appalachian, 26.

The southern firms placed the professional foresters in forest management posts in proportions exceeding those of other parts of the country. The number so assigned rose from 117 to 524 in the South in the seven years surveyed. Elsewhere, the gains were: Appalachian, from five to 18; Northeast, from 40 to 114; Lake States, from 29 to 67, and West, from 72 to 145.

The study of forestry personnel was one of five in APA's over-all forest management inventory of 171 companies operating 252 wood pulp mills.

•

$50,000 Fire Hits Institute at Appleton

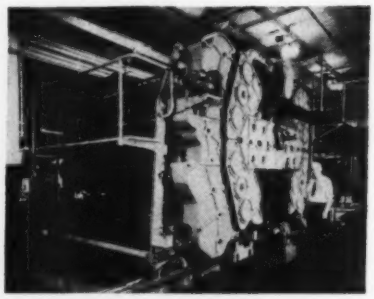
A fire in the old administration building of the Institute of Paper Chemistry in Appleton, Wis., caused damage estimated at $50,000 on August 21. Offices, classrooms, chemical equipment and labortories were damaged. The cause was not determined.

Almost all the city's fire equipment was called out to fight the blaze, and several firemen suffered from smoke exposure. Witnesses claimed that there were several explosions.

•

News of the Industry . . .

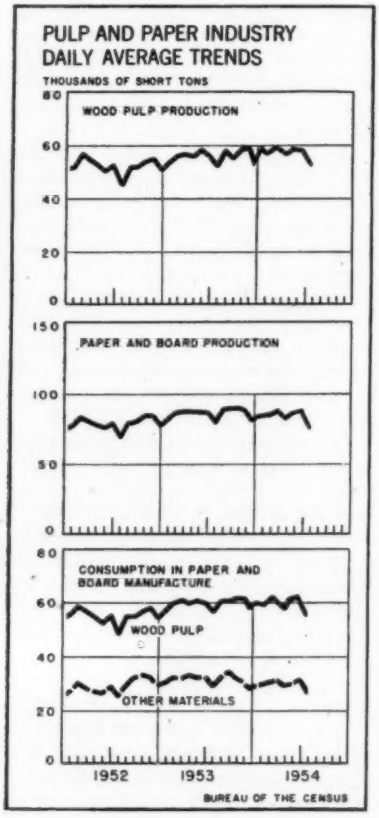
Standard Paper Products Co., Milwaukee wholesale paper company, is constructing a 45,000-sq. ft. warehouse and office building. Standard, a subsidiary of Butler Co. of Chicago, announces that the land and building will cost approximately $400,000.



FIRST DOUBLE STACK rotary letterpress for use in the production of bread and frozen food wraps is shown ready for shipment to Marathon Corp.'s converting plant at Menasha, Wis.; built by Kidder Press Co. of Dover, N. H., the unit is designed to print multi-color wrappers at speeds up to 850 fpm and widths up to 72 in.; the press is an interchangeable cylinder type, can use printing circumferences from 36 to 48 in., and is available with six, seven or eight colors in eight-color framing

July Pulp, Paper and Board Production

Paper and board production during July amounted to 1,998,093 tons, according to a report released by the Bureau of the Census. This is a 2 per cent decrease from the 2,042,021 tons produced in July 1953. Paper production amounted to 857,783 tons, almost 2 per cent below the 872,210 tons produced in July a year ago. The output of paperboard during the month was 890,219 tons, reflecting a 4 per cent decrease from the production of 929,521 tons reported in the same month in 1953.



Pulpwood receipts at the pulp mills during July amounted to 2,264,441 cords, with consumption at 2,240,226 cords. Month-end inventories at 4,722,649 cords showed a slight increase.

Wood pulp production during July amounted to 1,387,878 tons, as compared to 1,360,761 tons produced in July a year ago.

Wood pulp inventories at the end of July at the paper and board mills amounted to 510,274 tons, showing a 4 per cent increase during the month. Month-end stocks at the pulp mills were 164,420 tons.

U. S. Paper and Paperboard Production

	July 1954 (tons)	June 1954 (tons)	July 1953 (tons)	Total 1953* (1,000 tons)	Total 1948
Paper and Board, total	1,998,093	2,272,372	2,042,021	26,459	21,897
Paper, total	857,783	967,359	872,210	11,394	11,119
Newsprint	99,410	97,510	86,624	1,069	876
Groundwood paper (uncoated)	54,739	66,214	59,784	771	772
Printing and converting (coated)	95,257	101,513	93,009	1,182	809
Book paper (uncoated)	106,764	132,163	128,037	1,623	1,570
Fine paper (writing, cover and text, bristols, thin paper and other)	91,363	113,292	91,846	1,290	1,141
Coarse paper (unbleached kraft, glassine, greaseproof, vegetable parchment and other)	251,615	285,178	256,249	3,398	3,027
Special industrial paper (including absorbent)	34,475	43,509	36,660	533	415
Sanitary tissue stock	108,381	108,319	101,833	1,277	983
Tissue paper (except sanitary and thin paper)	15,779	19,661	18,168	231	205
Paperboard, total	890,219	1,033,986	929,521	12,220	9,366
Container board, total	488,532	558,552	520,867	6,613	5,079
Liners	319,414	371,781	355,482	4,411	3,347
Corrugating material	147,009	160,904	141,278	1,906	1,376
Container chipboard	22,109	25,867	24,107	296	319
Bending board	266,481	315,380	264,368	3,566	2,153
Nonbending board	57,943	74,505	65,330	898	597
Special paperboard stock	71,807	78,147	73,990	1,071	1,568
Cardboard	5,456	7,402	4,966	72	87
Wet machine board, total	8,431	11,247	11,609	155	142
Construction paper and board, total	241,660	259,780	228,681	2,688	2,591
Construction paper	114,860	127,024	108,758	1,312	1,321
Hardboard and insulating board	126,800	132,756	119,923	1,376	1,270

(*) Preliminary report. Source: U. S. Department of Commerce.

.....MEET BELISARIUS J. SYNNICK

(who thought ALL Industrial Clutches were alike!)

■ Actually there may have been some foundation to Belisarius' logic—but that was before he knew about FAWICK Airflex. Since he has seen FAWICK advantages transformed into greater machine efficiency and productivity on his own equipment, he agrees that FAWICK is superior on all performance counts!

On the matter of increased machine productivity he finds that FAWICK provides unmatched FAST, FULL POWER and SHOCK-FREE OPERATION from either local or remote control—with peak overload protection at selected air pressure.

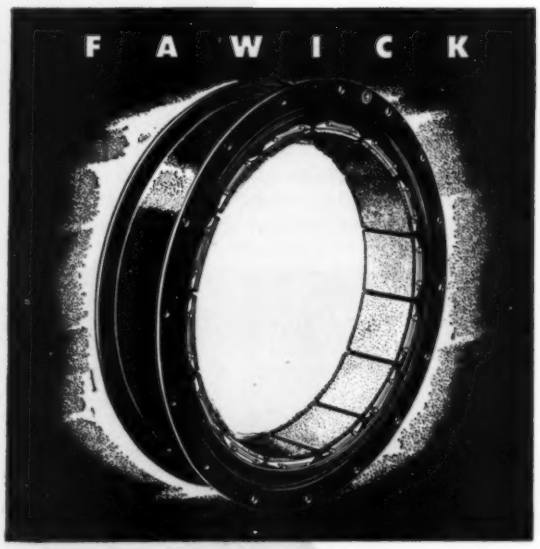
As to operating costs, he finds that FAWICK has exceptionally low operating wear, resulting from maximum clutch heat dissipation and complete separation of the friction shoes and drum when disengaged.

In addition, he has discovered that FAWICK units provide "new clutch" performance throughout their long service life, as they require practically no maintenance and automatically adjust for operating wear of the friction shoes

Belisarius now knows, like thousands of industrial users, that these and many other FAWICK advantages are performance-proved fact—not mere claims.

FAWICK engineers will be glad to show you, without obligation, the many operating and safety advantages of FAWICK Airflex CLUTCHES and BRAKES as applied to your equipment.

The performance-proved FAWICK TYPE CB Airflex CLUTCH.



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FAWICK Airflex

INDUSTRIAL CLUTCHES AND BRAKES

Wooden bowl big as a football field in the left foreground is used to store wood under water. Designed to prevent wood decay, the pond is the first of its kind in the world

Bowaters Southern newsprint mill in operation*

▶ The third and largest newsprint mill in the South is now in full production. An outstanding feature of this new mill is the first large-scale underwater pulpwood storage installation in the world.

WITH THE COMPLETION of Bowaters Southern Paper Corp.'s new pulp and paper mill at Calhoun, Tenn., the third and largest newsprint mill in the South is now in full production. The new mill has an initial annual capacity of 130,000 tons of newsprint and 55,000 tons of kraft pulp. The purchase of the entire output of newsprint for the next 15 years is guaranteed by 100 southern newspapers, many of which were formerly supplied from Bowaters' newsprint mill at Corner Brook, Nflnd. The kraft pulp produced in the new mill will be shipped to the Bowater Paper Corp. Ltd. mills in London, England.

The new mill is favorably located in respect to rail, highway, and inland water transportation. It is bounded on one side by U. S. Route 11 and the Southern Railroad System and on the other by the Hiwassee River, which is navigable for barge traffic. All three methods of transportation will be used to supply the mill with its daily requirement of 900 cords of pulpwood.

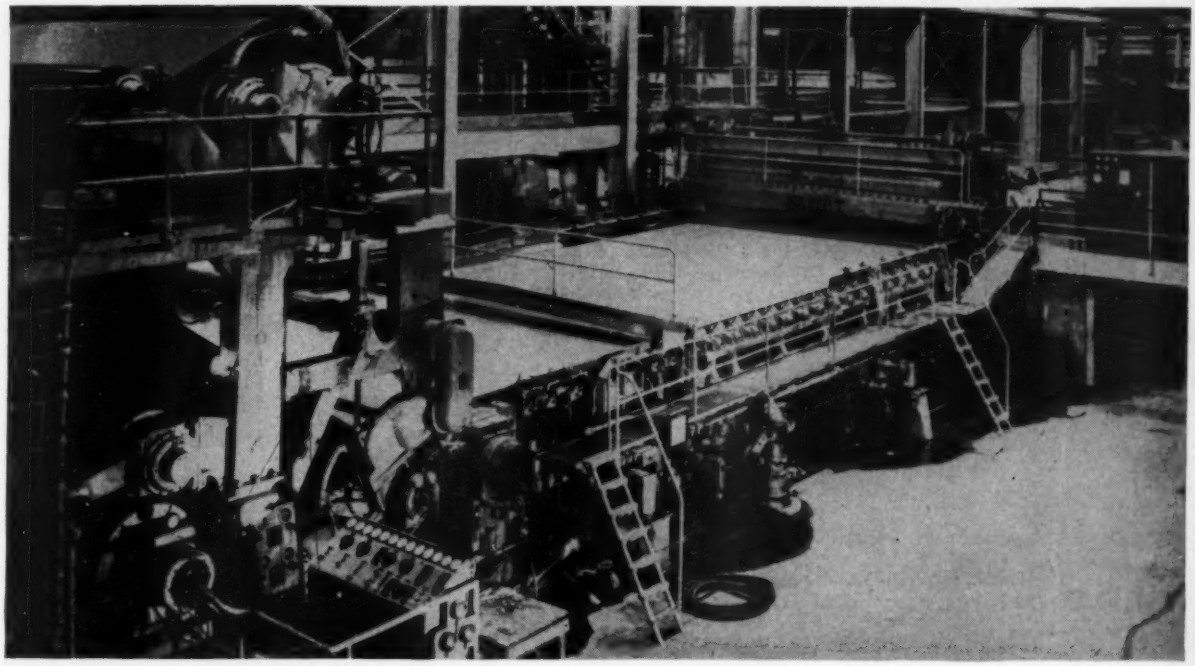
The mill has a further advantage of being located near important coal fields; it also has a natural gas line, as well as facilities for obtaining power from the Tennessee Valley Authority.

The mill's daily chemical consumption includes approximately 20 tons of salt cake, 8 tons of caustic, 8 to 18 tons of chlorine, and 14 tons of lime.

Sir Eric Vansittart Bowater
Chairman of the Board

K. O. Elderkin
Vice President and General Manager

*Condensed largely from reports by D. G. Moon of J. E. Sirrine Co., Greenville, S. C.



Wet end of No. 1 newsprint machine at Calhoun, showing at the extreme right the control panels installed on a flying bridge operated between the head boxes of the two machines

For the newsprint furnish some 4000 gal. and for water treatment some 1200 gal. of 32° Baume liquid alum will be required.

The mill employs 700 to 750 workers, who receive approximately $3,500,000 in wages. A similar amount, or more, will be spent on procurement of pulpwood and other materials.

Wood handling and preparation

The company has acquired about 200,000 acres of forest lands in Tennessee, North Carolina, Alabama, and northern Georgia, and by the end of 1954, 10,000,000 pine seedlings will have been planted on company-owned property in accordance with a planting program started several years ago.

One of the outstanding features of the wood handling system is the wood storage pond, the first large-scale underwater storage installation in the world. An enormous bowl—500 ft. across at the top and 360 ft. at the bottom—the pond holds approximately 30,000 cords of pulpwood, enough to keep the mill running for about six weeks. Powerful Gantry cranes take the pulpwood from rail cars, trucks, or barges to a conveying system feeding three large rotary barkers, where the bark is removed before the logs go into the pond. Wood is fed from the barking drums to two parallel cable conveyors which run from the drums to the woodroom and to the center of a duplex storage pond. The duplicate arrangement of the pond and all equipment for storing and conveying wood is due to the necessity of keeping separate the wood prepared for the groundwood mills.

The cable conveyor dumps the wood to a 40-ft. diameter turntable located in the center of the pond. It is then scraped onto a revolving stacking conveyor of special design, which places the wood in a semicircular pile in the pond.

The recovery of wood from the pond is by means of duplicate pivoted Gantry cranes, which place it onto chutes at the center of the pond turntables from which it is scraped off into the lower strand of the appropriate cable conveyor.

Both cable conveyors unload onto a 40-ft. diameter turntable at the top floor of the woodroom. Wood for mechanical pulp can be scraped off into the butting saw, while the wood for chemical pulp is scraped off into the chipper chute. The former operation comes first in the sequence, so that logs unfit for mechanical pulp can be allowed to pass on to the chipper feed point, or sent back to the barking drums by means of a belt conveyor.

A 1900-ft. long flume carries the logs for mechanical pulp to the grinder room, where they are elevated from the flume to the apron conveyor feeding two grinders by means of two chain conveyors.

Chipped wood for chemical pulp is fed by belt conveyor to a surge bin with star feeders, and thence to a pair of chip screens. Accepted chips from the chip screens are carried by belt conveyor to chip silos, where distribu-

V. J. Sutton
Mill Manager and
Asst. Gen. Manager

C. E. Opdyke
Comptroller and
Treasurer

D. W. Timmis
Secretary and
Asst. Treasurer

E. L. Cowan, Chief Engineer; C. R. Koons, Industrial Relations; J. N. Swartz, Technical Service Supt.; T. G. Bannister, Sulfate Superintendent; R. B. Reid, Purchasing Agent; J. J. Moynihan, Groundwood Superintendent; W. J. Parson, Paper Mill Superintendent

E. R. Streaty, Power and Steam Supt.; C. J. Maki, Woods and Yards Supt.; R. R. Edger, Woods Manager; R. L. Martin, Fin'g and Ship. Supt.; W. H. Jonhert, Traffic Manager; Otha Winningham, Mechanical Superintendent; M. J. Osborne, Electrical Superintendent

tion into the three silos is accomplished by an enclosed scraper conveyor. Rotary plate feeders which discharge the first of two belt conveyors remove the chips from the silos. The first belt conveyor carries the chips over a weighing device adjacent to the silos and discharges them to a second belt conveyor at the upper floor of the digester building. The second belt conveyor is equipped with a tripper for feeding the digesters.

Facilities are also available for a complete unloading of purchased chips from barges and railway cars. These consist of a concrete pit into which chips can be placed by crane or clamshell bucket, or dumped from hopper car which can be spotted over the pit, using a car shaker to assist unloading. The entire pit bottom is traversed by a drag chain which will carry chips to a belt conveyor which, in turn, will place them in the surge hopper feeding the chip screens.

Digesters

Five digesters of 3300-cu. ft. capacity are made of A-285 grade "B" fire box steel. Each digester has a shell thickness of 2 in. and weighs approximately 62 tons. The digesters discharge through electrically operated blow valves through individual lines to a blow tank having capacity for three blows.

The washroom features a specially designed trap leading to the preknotters, three 8- by 16-ft. vacuum type washers, a high-density steel storage tank of 100-ton capacity equipped with dilution nozzles and agitators, and agitated surge and blending chests.

The rejects from the preknotters discharge by gravity into a black liquor measuring tank, so that the knots are returned to the digester with the black liquor fill.

The washed stock is pumped from the surge tank to a consistency regulator and a primary constant level mix-tank feeding two primary centrifugal screens. From here it goes by gravity to two valveless-type thickeners and then to a screened stock chest. The rejects from the primary screens are pumper to another consistency regulator and then through a mix-tank to a secondary screen. Accepted stock from the secondary screen discharges into a tank, from where it is returned to the screened stock chest or fed directly to the pulp dryer machine chest.

Bleach plant

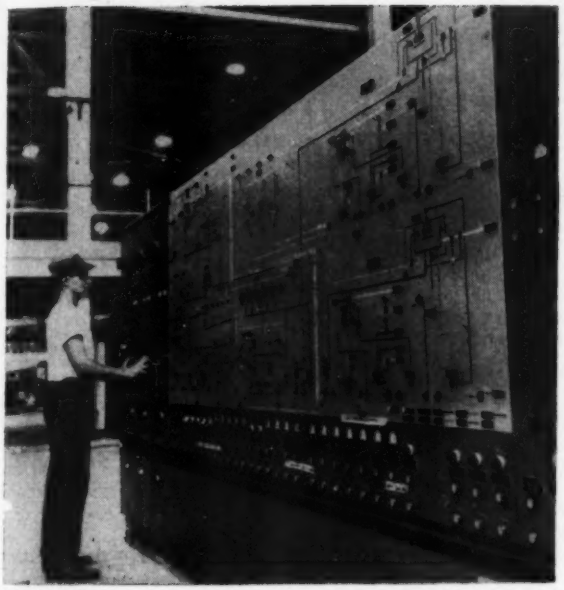
The bleaching operation is carried out in a three-stage bleach system.

The chlorination stage consists of a tile-lined steel tower, 18-ft. diameter by 60-ft. high, featuring two-tier arrangement of rubber-lined steel circulators and a rubber-covered skimmer to the launder at the top of the tower.

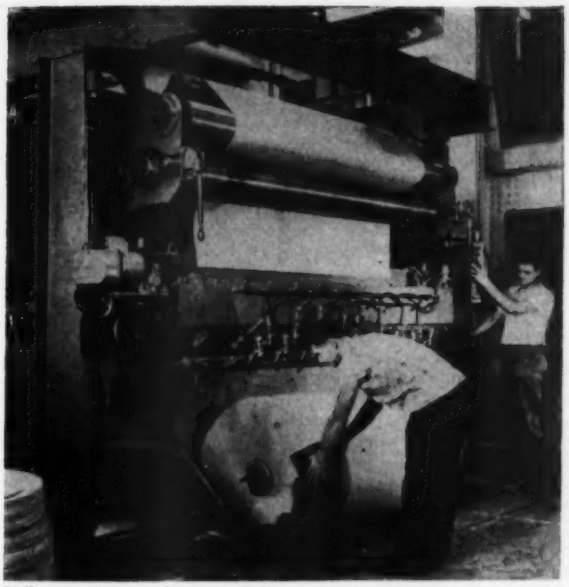
Chlorinated stock is pumped to an 8- by 14-ft. rubber-covered single-valve vacuum washer, with shredder and conveyor for discharging through

Exterior view of the digesters at the Calhoun plant

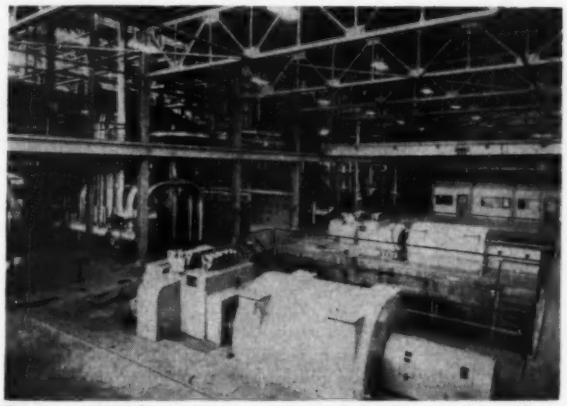
Grinder room at Calhoun



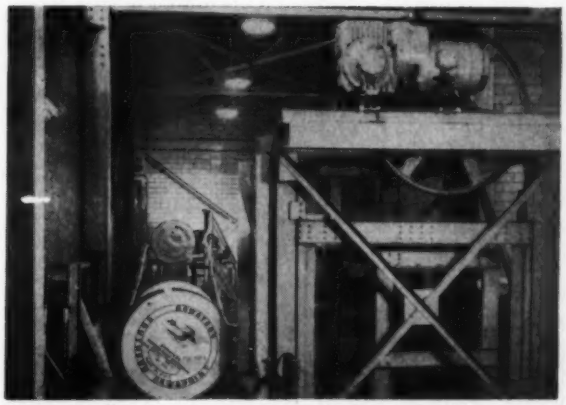
Semi-graphic control panel in the stock preparation room of Bowaters' modern mill



Roll wrapping machine at Calhoun. Unit is the first of its type installed in a U. S. mill



The two 10,000-kw turbo-generators and G. E. control panels at right are centralized in the middle of the floor



Wrapped rolls of newsprint moving along conveyor belt en route to storage and shipping at the Calhoun operation

the high-density double-shaft mixer of cast iron to a caustic extraction tower of unlined steel, 10-ft. diameter by 47-ft. high; with one circulator of cast iron and 304-type stainless steel construction.

Stock at the bottom of the caustic tower is diluted by nozzles to about 2½ per cent consistency for pumping to a cast iron single-valve vacuum washer with shredder and conveyor for delivery at high consistency through a double-shaft mixer to a steel, tile-lined hypochlorite tower, 17-ft. diameter by 17-ft. high, provided with two 304-stainless steel circulators.

At the bottom of the hypochlorite tower, the high-density stock is diluted by nozzles and pumped to an 8- by 14-ft. final vacuum washer with rubber-covered repulper.

Stock from the final washer passes through a pan-type consistency regulator which discharges directly into an agitated low-density tile storage tank, from where it can be pumped either to the newsprint mill or to the pulp dryer.

Groundwood

Pulpwood is ground in eight grinders, completely equipped with governors and hydraulic control equipment. Each grinder is driven by a 4500-hp water-cooled synchronous motor.

The groundwood stock preparation equipment consists of two bull screens, consistency control equipment, four primary centrifugal screens, and one secondary centrifugal screen.

A hammermill is used to break up bull screen rejects, which together with screen tailings are further refined in three drainers and disc refiners.

Ten 12-in. primary Dirtecs and 10 4-in. secondary Dirtecs remove the shives and dirt from the groundwood pulp, which is then thickened in six groundwood deckers.

Pulp dryer

Pulp is dried in a combination high-density feltless wet machine and a hot air dryer. The wet machine is of the two-press type with vacuum forming cylinder, 8-ft. diameter by 156-in. face and three air-loaded press rolls.

The first main press has a grooved cast iron top roll and bottom roll, which is followed by a two-drum dryer section, 16-in. diameter, and a second press similar to the first.

The dryer is equipped with pinch rolls which feed pulp into the first of its nine passes. Forty fans supply the necessary air circulation. The heaters are of the extented surface type and copper tubes. A 14-section economizer arranged for double heating service supplies some water heating.

Suppliers of equipment at Calhoun

Agitators	Improved Machinery Inc.
Air compressors	Ingersoll-Rand Co.
Air dryer	Pittsburgh Lectrodryer Corp.
Airveyor systems	Fuller Co.
Ash handling systems	American Monorail Co.
Bark feeder	Miller Hofft Inc.
Barking drums	Fibre-Making Processes Inc.
Bark shredder	Williams Patent Crusher & Pulverizer
Belt conveyor machinery	Transall Inc.
Belt tripper	Link-Belt Co.
Bird screens	Bird Machine Co.
Bleachery equipment & washers	Improved Machinery Inc.
Boilers (power, recovery and bark burning)	Combustion Engineering — Superheater Inc.
Blow heat & turpentine recovery systems	Foster-Wheeler Corp.
Blow-off equipment	Cochrane Corp.
Boiler chemical feed system	Milton Roy Co.
Broke disintegrators	E. D. Jones & Sons Co.
Brown stock washers & preknotter	Improved Machinery Inc.
Building elevators	Southern Elevator Co.
Cable conveyor equipment	Jefferson Foundry Co.
Cable conveyor machinery	Link-Belt Co.
Carloaders	Dempster Bros.
Causticizing equipment, clarifier	Dorr Co.
Centrifugal pulp screens	Appleton Machine Co.
Chip blowing system	Foster & Woods Inc.
Chip conveyors	Chain Belt Co.
Chip crusher	Waterville Iron Works
Chip magnets	Dings Magnetic Separator Co.
Chipper	Carthage Machine Co.
Chip screens	Orville Simpson Co.
Chutes	Bristol Metal Products Corp., Chattanooga Boiler & Tank Co.
Combustion control	Bailey Meter Co.
Consistency regulators	DeZurik Shower Co., Askania Regulator Co.
Continuous bleach lime slaker	Omega Machine Co.
Control instruments	Bristol Co., Fischer & Porter Co., The Foxboro Co.
Core-making machinery	Sonoco Products Co.
Cottrell precipitators	Western Precipitation Corp.
Crane & hoist	Robbins & Myers Inc.
Overhead cranes & paper reel cranes	Manning, Maxwell & Moore Inc.
Deareator heater	Graver Water Conditioning Co.
Demineralizers	Cochrane Corp.
Digesters	Chicago Bridge & Iron Co.
Digester blow valves	Yarnall-Waring Co.
Digester stock samplers	D. J. Murray Mfg. Co.
Dirtecs	Bird Machine Co.
Electric equipment—motors, cable, transformers, paper machine drives, turbo-generators, control equipment	General Electric Co.
Electric equipment—motors, surface condensers, transformers, control centers, water coolers, welching machines	Westinghouse Electric Corp.
Evaporators	Goslin-Birmingham Mfg. Co.
Extractor plates & frames	Laurel Machine & Foundry Co.
Closed feedwater heater	Lumus Co.
Feltless wet machine	Improved Machinery Inc.
Gantry cranes	Link-Belt Co.
Grinders & auxiliaries	Montague Machine Co.
Groundwood deckers	Improved Machinery Inc.
Hammermill	Jeffrey Mfg. Co.
Heat exchanger	Purser & London Inc.
Heating & ventilating systems, Washer & machine hoods	J. O. Ross Engineering Corp.
Hot water heater	Patterson-Kelley Co. Inc.
Hydraulic ejector	Duriron Co.
Hydraulic equipment	J. A. Postell
Hydro oil pressure cleaner	Hydro Silica Corp.
Equipment & piping insulation	North Bros.
Jordans	E. D. Jones & Sons Co.
Lime kiln & auxiliaries	Traylor Engineering Co.

The wet machine and the conveyors of the pulp dryer are driven by direct current motors, which are synchronized and receive their current from a single motor generator set.

Equipment for cutting, laying, and conveying the pulp includes a heavy-duty cutter, a heavy-duty type layboy, a single downstroke baling press, and a conveying system which comprises a 14-ft. swing section and storage belt with wrapper pick-up, an air float scale section, and a hinged roller press discharge section. A gravity roller conveyor and a lowerator stacker deliver the bales to the basement onto a storage conveyor 30 ft. long.

Paper machines

The two 252-in. newsprint machines are designed for speeds up to 2000 fpm. Stock and color are metered to a 12,000-gpm fan pump supplying the 10 screens.

Each machine has an air-cushioned inlet. Stock passes through an air motor-operated stream flow valve and enters the pressure head box through a patented cross flow distributor. In the head box, a constant stock level is maintained by means of air pressure; and self-cleaning rectifier rolls aid in keeping the fibers evenly dispersed as the stock flows through the head box. The constant stock level is maintained automatically.

The fourdrinier has a 252-in. wide by 116-ft. long wire and is equipped with table rolls, forming board, deflectors, suction boxes of modern design, a driven dandy roll, a patented air guide for the wire, and a suction couch roll with air-loaded packing strips.

The head box is lined with stainless steel. Of stainless steel construction also are all structural members of the fourdrinier and such items as savealls, forming board, deflectors, and suction boxes.

The press section consists of automatic suction pickup roll, a suction transfer press, wringer roll, and two straight through suction presses. These two machines are the first new newsprint machines equipped with the Beloit suction pickup arrangement.

The dryer section consists of fifty-five 60-in. diameter paper dryers and eleven 60-in. felt dryers, divided into four sections. The dryer shells are bored and turned to provide even shell thickness for even distribution of heat. The dryers are provided with high-speed condensate remover and duplex steamfits.

The calender stack is the open type, complete with eight rolls. All calender rolls are provided with flexible blade

doctors with Lodding holders, and oscillation is provided for the bottom doctor. The reel is the heavy-duty type equipped with the latest design of reel brake. The winders are of high-speed design, complete with shaft puller and roll lowering table.

The wire and couch pit is of special design and wet broke from the couch flows directly into a tile chest equipped with breaker agitation equipment. This chest also handles the press broke delivered by a conveyor from the presses.

The paper machines are equipped with transite hood and felt drying systems. Latest improvements in air make-up, heating and ventilating, motor cooling and trim conveying systems in the machine room and also the stock preparation room have been incorporated.

The newsprint rolls are discharged from the winder onto floor-type transfer conveyors which take them to an automatic roll-wrapping machine.

Black liquor recovery

For the evaporation of the black liquor from the kraft mill, a six-body sextuple effect evaporator has been installed. The unit has sufficient capacity to evaporate 173,000 lbs. of water per hour. To condense the vapors from the sixth effect, a surface condenser of the vertical type is used which consumes 1800 gpm of 70° water with a temperature rise to 110°. A soap skimming tank with a paddle type mechanical skimmer removes the soap from the liquor between the third and fouth effects.

The black liquor recovery furnace has a capacity to burn 950,000 lbs. of solids per 24 hours, with steam generating capacity of 123,200 lbs. per hour at 875 psi.

For soot blowing an air puff system has been furnished for the collector zone and the economizer passes, consisting of 16 heads automatically controlled for sequential operation. In addition, there are 12 retractable soot blowers for the clearing of the screen tubes and superheater elements, all arranged for double-side installation at six locations.

An electric precipitator unit consisting of two precipitators enclosed within a shell structure of combined hollow tile, steel, and reinforced concrete is an integral part of the recovery building above the cascade evaporators. Each precipitator has an individual stack and is so arranged that with one precipitator down, the other can still be maintained in operation. The recovered salt cake from the precipitator is collected and dissolved in four wet bottom pans through which concentrated liquor is circulated.

Suppliers of equipment (cont'd)

Kiln lining	J. L. Hamilton Engineering Co.
Knife grinders	Hanchett Mfg. Co.
Layboy & conveyors	Lamb-Grays Harbor Co.
Limestone handling system	Link-Belt Co.
Load lugger	Brooks Equipment & Mfg. Co.
Log conveyors	Chain Belt Co.
Log feeders, stackers	Link-Belt Co.
Meters	American Meter Co.
Metering stuff boxes	Trimbey Machine Works
Mixers	Mixing Equipment Co. Inc.
Motoreducers	Falk Corp.
Newsprint machines	Beloit Iron Works
Oil purifiers	DeLaval Separator Co.
Orifices	Daniel Orifice Fitting Co.
Paper machine oil system	DeLaval Separator Co.
Paper roll conveyors	Lamson Corp.
Paper roll handling equipment	Williams & Wilson Ltd.
Protective coating and tank insulation	Earl Paint Co.
Pulp bailing press	Washington Iron Works
Pulp cutter	Lamb-Grays Harbor Co.
Pulp dryer	J. O. Ross Engineering Corp.
Pulp dryer drive	Reliance Electric & Engineering Co.
Pulp stones	Norton Co.
Owen pulpwood grapple & chip bucket	Southern Corp.
Pressure magnetic humps	Eriez Mfg. Co.
Pulpwood grapple	Wellman Engineering Co.
Pulpwood rake	R. L. Harris Inc.
Pump sets	Coen Co.
Pumps	Allis-Chalmers Mfg. Co., Duriron Co., Fairbanks-Morse & Co., Ingersoll-Rand Co., Milton Roy Co., Warren Steam Pump Co., Worthington Corp.
Pumps (slurry)	Oliver United Filters Inc.
Pump (vacuum)	Nash Engineering Co.
Quaker conveyor belting	Noland Co.
Refiners	Sprout-Waldron Co.
Roll grinder	Farrel-Birmingham Co. Inc.
Roll wrapping machine	William & Wilson Ltd.
Rotary chip feeders	Jeffrey Mfg. Co.
Rotary pumping units	Viking Pump Co.
Savealls	Improved Machinery Inc.
Scales	Toledo Scale Co.
Screw conveyor	Link-Belt Co.
Slime measuring units	Buckman Laboratories Inc.
Soap skimmer	Link-Belt Co.
Stacks & breeching	Equitable Equipment Co.
Stock proportioners	Hydraulic Machinery Co.
Strainers	Elliott Co., Sarco Co. Inc.
Suction box conditioner	Fastwood-Nealley Corp.
Suction heaters	Stephen C. May
Tanks	Bristol Metal Products Corp., Chattanooga Boiler & Tank Co.
Tanks — shop built & field erected	Chicago Bridge & Iron Co.
Miscellaneous tanks	Equitable Equipment Co.
Tank — sulfuric acid	General Steel Tank Co.
Tank & boxes	Laurel Machinery & Foundry Co.
Texrope drives	Allis-Chalmers Mfg. Co.
Tile chests & lining	Stebbins Engineering & Mfg. Co.
Track retarders	General Railway Signal Co.
Travelling screens	Link-Belt Co.
Truck scale	Howe Scale Co.
Turntables	Carolina Steel & Iron Co.
Turntable machinery	Link-Belt Co.
Vacuum control systems	A. R. Broughton & Co
Valveless vacuum thickeners	Improved Machinery Inc.
Valves	Continental Equipment Co.
Vapor circulating systems	Midwest-Fulton Machine Co.
Vertical pumps	Equipment Inc.
Vibrating screens	Allis-Chalmers Mfg. Co.
Vibratory screens	Improved Machinery Inc.
Water coolers	Westinghouse Electric Corp.
Weighometer	Merrick Scale Mfg. Co.
Winders	Beloit Iron Works

"Mile a minute" winder is proving itself*

M. H. FISHER
Westinghouse Electric Corp.

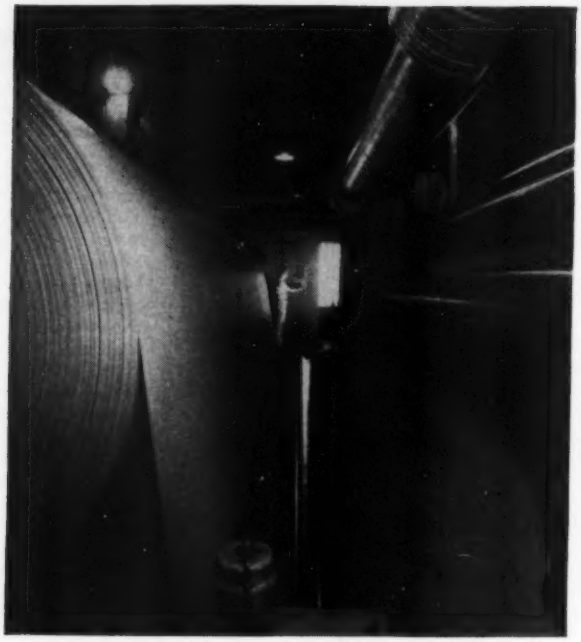


Fig. 1—Looking across the parent roll; winder is on the right, with the control cubicle in the background

▶ The all-electric winder drive equipped with constant tension braking, inertia compensation, current-limit acceleration and deceleration, and other controls points toward optimum performance

THE NEW "MILE A MINUTE" winder drive at West Virginia Pulp & Paper Co. in Charleston, S. C., has been in continuous service since February 1953 and has proven itself to be one of the best of its type for convenience of operation, drive performance, and operating costs. During the past year it has attained operating speeds greater than 5200 fpm.

The Charleston winder, which follows No. 1 paper machine, is a Cameron "Imperial 100" design. It accommodates a parent roll 234 in. wide and 84 in. in diameter, weighing up to 34,000 lb. Kraft board of weights from 26 to 69 lb. per 1000 sq. ft. is rewound by the winder into rolls of suitable size for shipping. A 350-hp winder drive motor, a 187-kw braking generator, and a 200-kw power supply generator, all capable of handling 200 per cent load during speed change periods, achieve the required production cycles. The latest type of magnetic amplifier regulators get maximum performance from the drive within the capacity of the electrical equipment.

*Prepared exclusively for publication in The PAPER INDUSTRY.

The magnetic amplifier control utilizes saturable reactors, dry type rectifiers, and resistors, arranged in circuits capable of achieving accurate regulation and automatic control of the electrical drive equipment. A magnetic amplifier control regulates sheet tension by controlling the braking generator shunt field to hold constant current in the braking generator armature circuit. Magnetic amplifier current limit control overrides the speed control system during acceleration and deceleration.

Since this winder is of the two-drum surface type, the winder drive motor is a constant speed dc motor. Acceleration and deceleration of this motor is accomplished by voltage control of the main generator. The 350-hp rating was selected on the basis of holding a tension of 9 lb. per in. of width in the sheet. The 200 per cent overload capacity is necessary to achieve rapid acceleration.

The unwind braking generator is an adjustable speed machine, the speed range of which is 228 to 1370 rpm at constant 250-armature volts and 5000-fpm paper speed. This range is necessary to accommodate the change in parent roll diameter from 84 to 14 in. at 5000 fpm paper speed. The 187-kw rating was selected on the basis of holding the required sheet tension of 9 lb. per in. of width. The 200 per cent overload capacity is necessary to achieve rapid deceleration. A booster generator is provided in series with the braking unit to provide voltage for IR drop compensation, for inertia compensation, and to inch the braking generator to achieve pay-out or slack take-up.

A 200-kw dc generator capable of 200 per cent load during acceleration and deceleration periods is the power source. Although this unit supplies only 65 kw of power to run the winder at the constant speed of 5000 fpm, the requirements of acceleration and deceleration dictate the 200-kw rating. The generator is powered by a 380-hp, 1200-rpm, 2300-volt, 3-phase, synchronous drive motor. The booster and a 15-kw constant potential dc exciter are parts of this set.

Automatic recalibration of tension regulator

Superior performance is the winder's strongest advantage. This drive starts from rest with tension on the sheet. No manual adjustments of tension are required during acceleration or deceleration since the tension is held

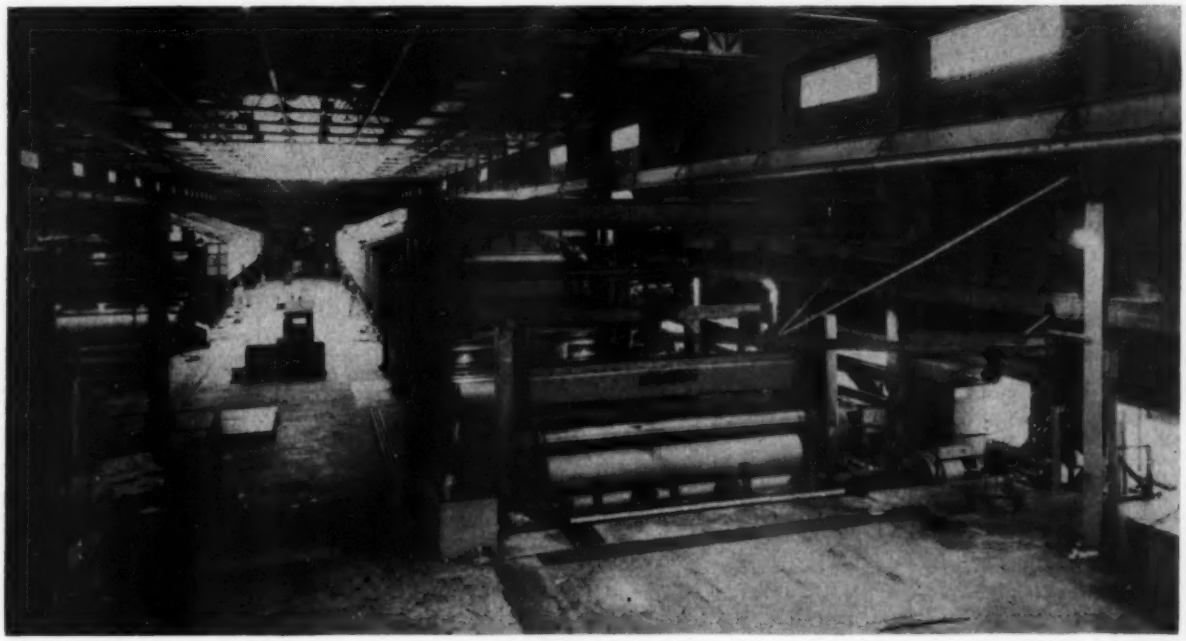
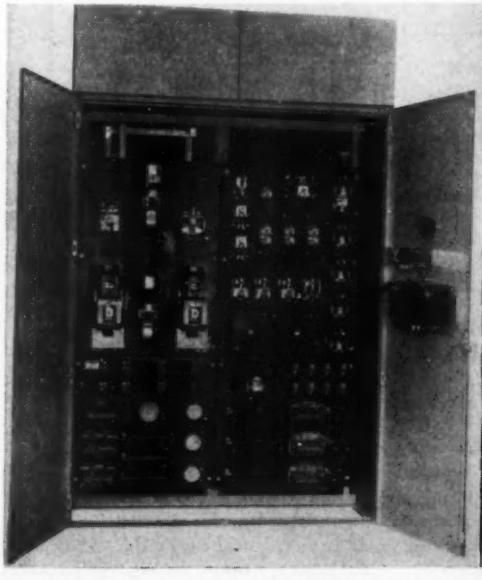


Fig. 2—Overhead view of the winder and drive; control cubicle, braking generator and winder drive motor are at the right

during these periods by automatic inertia compensation provided by the magnetic amplifier control. When turning at a circumferential speed of 5000 fpm, a roll 84 in. in diameter and 234 in. wide has 3800 hp-seconds of stored energy. If this roll of paper is to be accelerated in 35 seconds, then an average of 215 hp must be exerted to supply the kinetic energy alone, and on top of this, the horsepower to overcome required windage friction and to keep tension must be algebraically added. Thus, during acceleration the tension regulator is automatically recalibrated in a direction to reduce the pull of the braking generator and maintain constant tension in the web. With an ordinary mechanical brake the tension in the sheet would be much greater than desired during acceleration.

During deceleration, the tension regulator is automatically recalibrated to increase the torque exerted by the braking generator to maintain constant tension in the sheet, and at the same time absorb the kinetic energy in the roll. Again, with an ordinary mechanical brake the tension in the sheet would be too low; and the sheet would become loose, or excessive stopping time would be required.



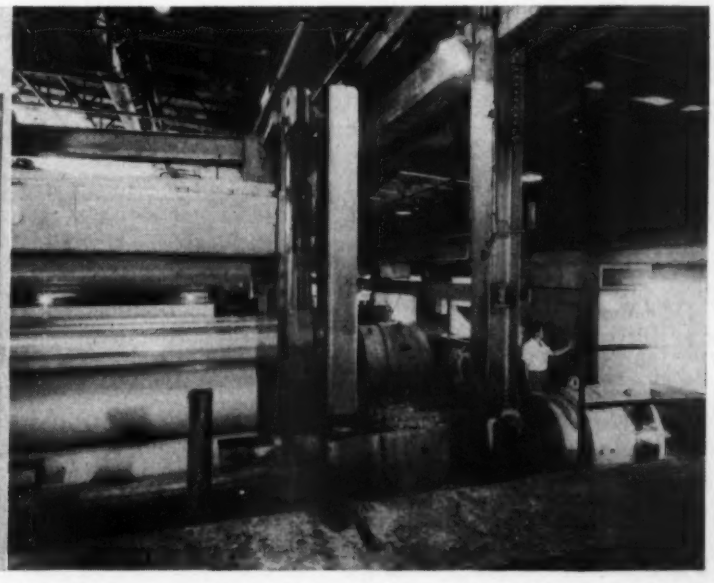


Fig. 3 (Left)—Shop view of control cubicle; note the tension and the current limit magnetic amplifiers on the bottom panels. Fig. 4 (Right)—Winder drive units; braking generator in background and winder drive motor in foreground

The convenience of operating an all-electric drive is unexcelled by other types of drives. Rolls weighing 35,000 lb. are not easy to turn by hand; the electric brake makes hand turning unnecessary. Paper is paid out from the parent roll by pushing a "pay out" pushbutton. Pay out occurs only as long as the button is held down. After the paper is threaded through the winder and onto the shipping core, there may be some slack in the sheet immediately following the parent roll. This slack is undesirable since the winder may start the parent roll with sufficient jerk to snap the sheet. A "slack-take-up" pushbutton is provided to conveniently remove this slack and insure a smooth start.

"Start" pushbutton sets up all circuits

With the magnetic amplifier no resetting of rheostats is required to hold essentially constant tension from standstill to 5000 fpm or during winding when the parent roll is being reduced in diameter. After threading, the operator simply presses the "start" pushbutton, which sets up all circuits and puts stall tension on. A "ready" pilot lamp indicates that the circuits are set up. He then turns his operating handle to "run" position and the drive accelerates to full speed under current limit control without further attention. When the desired shipping roll diameter is approached, the operator returns the operating handle to "off" position, and a normal step is accomplished by regenerative braking, again under current limit control. Acceleration and/or deceleration can be accomplished at a slower rate by manually turning the speed control rheostat.

Sometimes it is desirable to wind shipping rolls "wire-side-in," while at other times it is desirable to wind them "wire-side-out." A reversing knife switch is provided in the armature circuit of the braking generator to permit its operation in either direction.

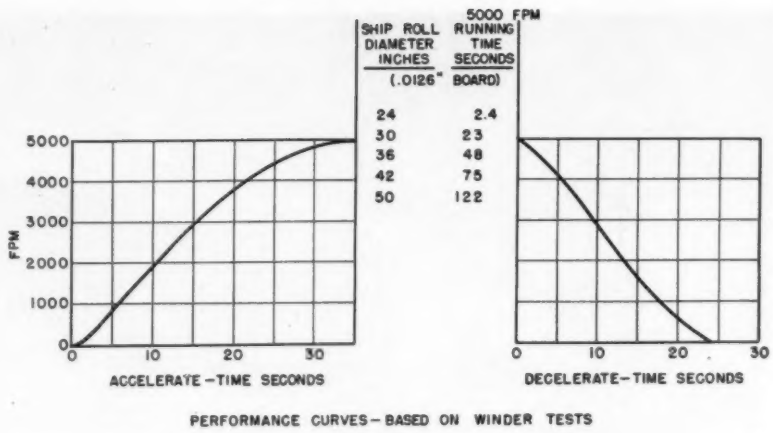


Fig. 5—Production cycle for the winder at Westvaco in Charleston

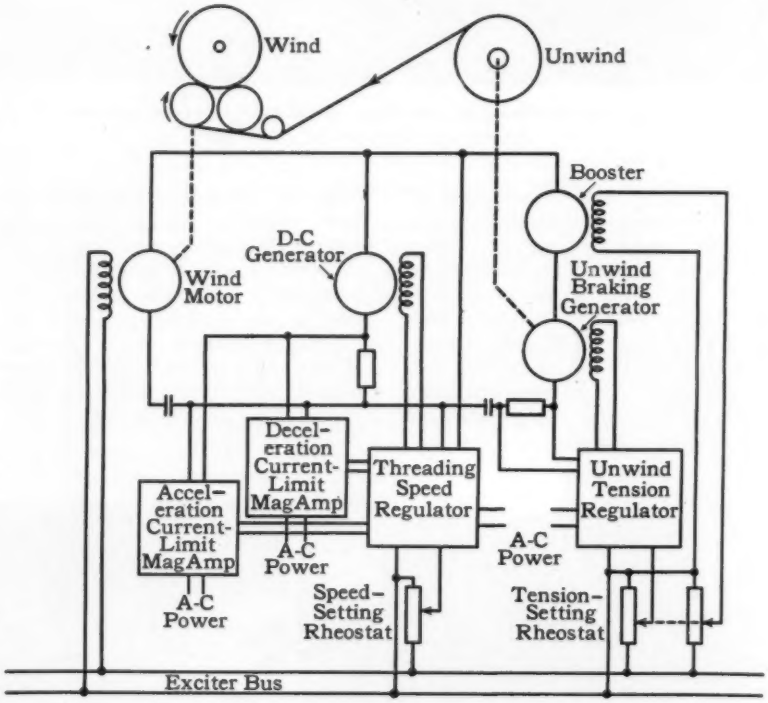


Fig. 6—Block diagram of winder control system

Power recovery in electric braking

One of the most attractive features of electric braking is the recovery of power that would otherwise be "poured down the drain" if a mechanical brake were used. When the No. 1 paper machine at Charleston is operated at 1450 fpm with 5 per cent brake average, then 160 shipping rolls of 50-in. diameter are made each 24-hour day. Tests indicate that the braking generator returns 950 amp at 240 v or 228 kw of power to the system. Considering 360 days per year operation, then about 550,000 kwhs of energy are saved per year. At 1 cent per kwh this represents $5500.00 per year savings.

When mechanical brakes are used, due to the large amount of energy which is absorbed by the brake, the brake must be large and the linings must be replaced about twice a year. This means down-time expense as well as the cost of the brake lining and labor.

The first cost of the electric braking generator is somewhat offset by the reduction in size of the m-g set and the ac starter, since the power recovered by using an electric brake results in the selection of a smaller power supply generator. On the Charleston winder a 200-kw dc generator is able to supply a 350-hp dc motor with the apparent deficiency of power being furnished by the braking generator. If a mechanical brake had been used, a 300-kw generator and a 500-hp synchronous m-g drive motor would have been required.

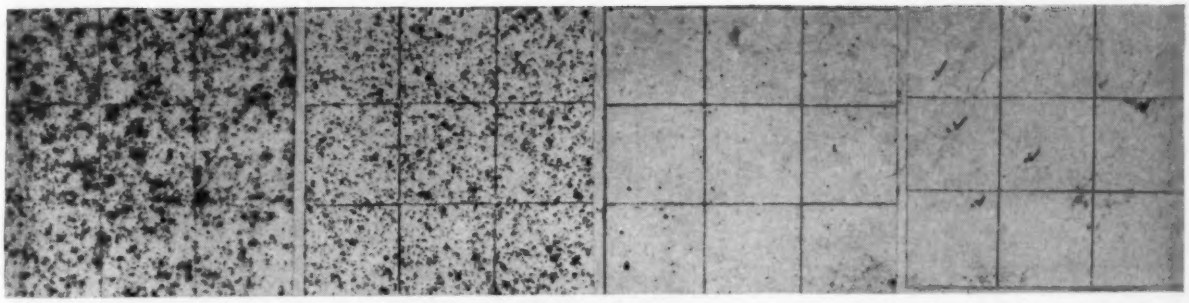


Fig. 1—Knot Count of Groundwood Pulps. (A) Pulp from screw press; 3460 knots per gm. (B) Pulp after bleach run through Rotapulper; consistency entering 42.5 per cent, leaving 33 per cent; 3795 knots per gm. (C) Pulp from "B" after 15 min. in ribbon mixer at 12.5 per cent consistency; 217 knots per gm. (D) Pulp from "C" after one pass through Rotapulper; consistency 12.5 per cent; 333.5 knots per gm.

The problem of knot formation in high-consistency bleaching*

WILLIAM J. NOLAN† and BRUCE ARMSTRONG‡

▶ The Rotapulper, while being responsible for increased knot formation at high pulp consistencies, is an efficient means of removing knots at lower consistencies.

▶ Groundwood pulps are worst offenders — they form tight, hard knots; knots in kraft pulps are loosely bound together and easily broken up; sulfite pulps are between these extremes.

PAST EFFORTS AT BLEACHING at very high consistency have been unsuccessful, primarily because of poor mixing of reactants. In fact, uniformity of blending between bleach and pulp, even at 12 to 14 per cent, is quite difficult to achieve.

It was not until the development of a high-speed rotary mixer that thorough and intimate bleaching of high consistency pulp, even in the 30 to 40 per cent consistency range, has become possible.

It has been known for many years that the dewatering of pulps to high consistency in rotary screw presses will result in the formation of entangled lumps or knots of fibers.

This phenomenon of knot formation presented a problem which, if not solved, would probably preclude the practical use of high-density bleaching techniques. Therefore, this discussion is devoted to a study of the factors involved in the formation of knots and to an exploration of methods for removing them.

The Rotapulper, or any such high-speed machine, when handling pulps of high consistency, will form many more knots than any screw press. The very property of intensive mixing which permits the intimate mixing of pulp and bleach also promotes the formation of knots at high consistency.

Cause of knot formation

The direct cause of knot formation is the moisture content of the pulp. There appears to be a critical range of moisture content. At moistures below this range, the pulps are so light and dry that, when passed between high-speed rotary plates, they roll rather than slide between the plates. This rolling motion results in entanglement of fibers, and the plates actually roll the entangled fibers into tight balls. At moisture contents above the critical range, the fibers slide, rather than roll, and no knots are formed. In fact, this sliding action is so pronounced that the same rotary plates used to form knots can be used to eliminate a surprising number of them.

A third factor governing the formation of these knots or balls, and their removal after they are formed, is the fiber length of the pulp itself. Groundwood appears to be the worst offender in regard to knot formation; and, once formed, these knots are quite difficult to remove. With kraft pulps, on the other hand, the knots are soft and loosely bound together and are easily broken up. Sulfite pulps fall between these extremes. Some sulfites behave almost like kraft pulps, while other sulfites offer almost as much resistance to knot removal as groundwood.

A summary of the results of the experiments on knot formation and removal is presented in the table. Figs. 1-4 are photographs of typical sheets selected to show the effects of the treatments. While being photographed, the sheets were placed on a glass plate, behind which was a strong light. The resultant pictures appear very similar to the original sheets during the actual knot count. The ruled, one-inch squares, used in evaluating the area counted, appear on the photographs. In cases where knot count is low, the knots are identified by pencil checks so that the observer may distinguish between a true knot and dirt specks or shives.

Knots in groundwood pulp

Groundwood pulp, while being pressed to about 40 per cent consistency, will form a tremendous number of knots and small lumps. It is impossible to obtain an exact count of the knots, estimates from about 3000 to well over 4000 having been obtained. The knot count averages 3460

*From a paper presented at the 35th annual American Pulp & Paper Mill Superintendents Association Convention.

†Professor of chemical engineering, University of Florida.

‡Technical director, Jackson & Church Co.

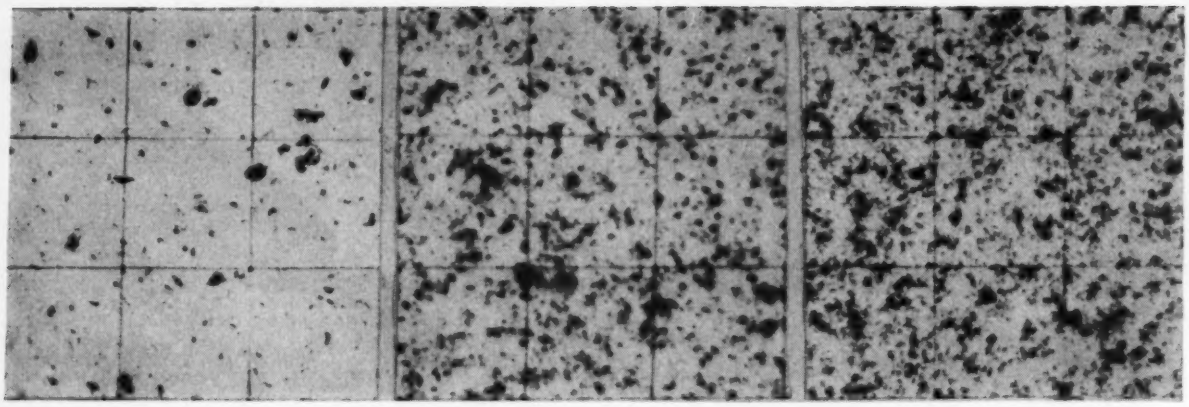


Fig. 2—Knot Count of Sulfite Pulps (all processing at high consistency). (A) Pressed pulp after 45 min. mixing at 25 per cent consistency in ribbon mixer; 748 knots per gm. (B) Pulp after one pass through Rotapulper at 25.8 per cent consistency; 2800 knots per gm. (C) Pulp after two successive passes through Rotapulper at 25.8 per cent consistency; 3600 knots per gm.

knots per gram of dry pulp. A typical sheet after the screw press is shown in Fig. 1a. This pulp, at 42.5 per cent consistency, was passed through the Rotapulper, using bleach in the spray nozzles. All operating conditions were the same as for a typical bleach run. The pulp was sampled after the Rotapulper and was found to have an average of 3795 knots per gram. One of these sheets is shown in Fig. 1b. It can be seen that the knots are much more sharply defined than in Fig. 1a. The Rotapulper has converted many small lumps, formed in the screw press, into tight, hard knots.

A further test on the same groundwood indicated the relative hardness of the knots from the screw press and from the Rotapulper. Part of the pressed pulp, at 42.5 per cent consistency and containing 3460 knots per gram, was placed in the spiral ribbon mixer and was diluted with water to 28.1 per cent consistency. Mixing was carried on for 15 min. The diluted pulp was passed through the Rotapulper, using no liquid but using the plate clearance and pulp feed rate used in a normal bleach run. The final knot count of the pulp was 1347 knots per gram as compared to 3795 when no mixer was used and bleach was added at the Rotapulper. Apparently, the ribbon mixer eliminated a large number of the small knots or lumps formed in the screw press. It is unfortunate that a knot count was not taken immediately after the ribbon mixer.

Knots in sulfite pulps

Sulfite pulp from mill C was pressed in the screw press to a consistency of 40.0 per cent. The pulp was so lumpy that sheets could not be formed. These lumps were so large that they could not be considered as knots. The pulp was diluted in the ribbon mixer to 25.8 per cent consistency. The lumpy condition of the pulp made it necessary to extend the mixing time from 15 to 45 min. in order to obtain uniformity. After mixing, the pulp was found to contain 748 knots per gram. Of this total, 21.9 per cent could be classified as lumps rather than knots. A sample sheet of this pulp is shown in Fig. 2a.

This pulp was then passed through the Rotapulper, using the same plate clearance and pulp feed rate as in a bleach run but using no liquid. After passing through the Rotapulper, the pulp contained 2800 knots per gram, as shown in Fig. 2b. As a matter of curiosity, the product was passed through the Rotapulper a second time under the same conditions. The knot count increased to 3600, as shown in Fig. 2c. The knots formed by this high-density treatment wese quite hard and mostly small.

A knot count under actual bleaching conditions was not made on this pulp, using bleach to dilute from 40 to 30 per cent consistency. However, press pulp was mixed in the ribbon mixer with NaOH and Na_2SiO_3 at the same concentration as when bleach is used. Feed to the Rotapulper was 30 per cent consistency. The pulp leaving the Rotapulper contained 2500 knots per gram.

Another sulfite pulp, from mill D, was studied for knot formation. This pulp, after pressing to 39 per cent consistency, contained 364 knots per gram, only 10.1 per cent of which could be classified as knots, the remainder being soft, large lumps. The pulp was passed through the Rotapulper in a regular bleach run, all conditions being the same as for bleaching. The bleach spray reduced consistency from the entering value of 39.0 to an exit figure of 31.5 per cent. Knot count of the exit pulp was only 201 knots per gram. These knots were small but not nearly as sharply defined as the knots in the pulp from mill C, indicating that the fibers were not as tightly knotted.

Knots in kraft pulps

A bleached kraft pulp from mill E was pressed to 40.0 per cent consistency. The pulp, being too lumpy for sheet formation, was diluted with water to 32.5 per cent consistency by 15-min. mixing in the ribbon mixer. The pulp sheets from this treatment contained 220 knots per gram. Most of these knots were lumps. A photo of one of these sheets is shown in Fig. 4a.

The pulp at 32 per cent consistency was passed through the Rotapulper, using no liquid in the bleach sprays, all other conditions being the same as for a bleach run. These conditions increased the knot count to a value of 763 knots per gram. Fig. 4b shows that these knots, although numerous, are quite soft and poorly defined. This indicates that the fibers are not nearly as tightly entangled as those fibers from shorter fibered pulps.

First deknotting attempts

The first attempts at deknotting were made on sulfite pulp from mill C. It had been hoped originally that the retention tower, while diluting the pulp from bleaching to pumping consistency might be used to remove knots from the pulp. Very extensive tests were carried out in which the bottom section of the tower was filled with knotty pulp (2800 knots per gram) at various consistencies.

It was concluded from the tests that the pumping time required in the bottom of the tower was so high as to make retention tower deknotting completely impractical.

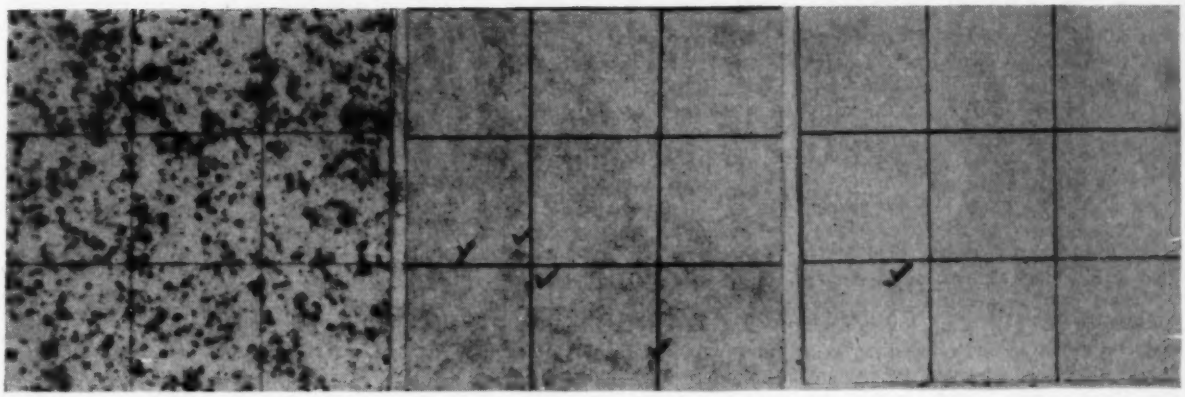


Fig. 3—Knot Count of Sulfite Pulps (processing done at low consistency). (A) Pulp after one pass through Rotapulper at 25.8 per cent consistency; 2800 knots per gm. (B) Pulp similar to "A" mixed 15 min. at 14.2 per cent consistency in ribbon mixer, then passed once through Rotapulper at constant consistency; 8.4 knots per gm. (C) Same as "B" except that water has been added at Rotapulper sprays, reducing consistency from 14.2 to 10.6 per cent; 2.3 knots per gm.

The next deknotting experiments involved the use of the laboratory Niagara beater.

It became obvious from the results that beater treatment would be commercially impractical for knot removal, since the Niagara beater cycles are very short compared to cycles of commercial beaters.

Low density pumping was next examined as a possible deknotting procedure. Groundwood from mill B was pressed and passed through the Rotapulper in a regular bleach run. Consistency leaving the Rotapulper was 33.0 per cent and knot count was 1347. The pulp was diluted in a tank to 2.3 per cent consistency. The diluted pulp was then recirculated continuously in the tank using the Buffalo low density pump. The pumping rate was such that the contents of the tank received one complete circulation in about 40 sec. The relationship between knot content and pumping time was as follows:

Time of circulation (min.)	Knots per g. of pulp
10	264
20	246
30	86
45	36
60	24
120	7
210	6

These data indicate that, for groundwood at least, several large stock chests and pumps would be required to completely deknot the bleached pulp. It was felt that some more effective treatment must be developed.

The effect of the spiral ribbon mixer on the deknotting of sulfite pulp from mill C was next evaluated. Pulp from the screw press, containing about 750 knots and lumps per gram o.d pulp, was placed in the ribbon mixer, and water was sprayed into the mixing mass until consistency was about 13 per cent. The pulp was sampled periodically for knot count with the following results.

Time of mixing (min.)	Knots per g. dry pulp
15	296
45	223
75	181
105	161
135	149

As mixing progressed, the large lumps became smaller and disappeared; but the small hard knots did not appear to diminish.

The use of the Rotapulper in deknotting

Finally, the Rotapulper itself was studied as a possible means for removing knots.

Groundwood from mill B, which had been passed through the Rotapulper at 28.1 per cent consistency and which contained 1347 knots per gram, was diluted with water in the ribbon mixer for 15 min. The knot count after mixing was 686 and consistency was 13.0 per cent. The pulp was passed through the Rotapulper

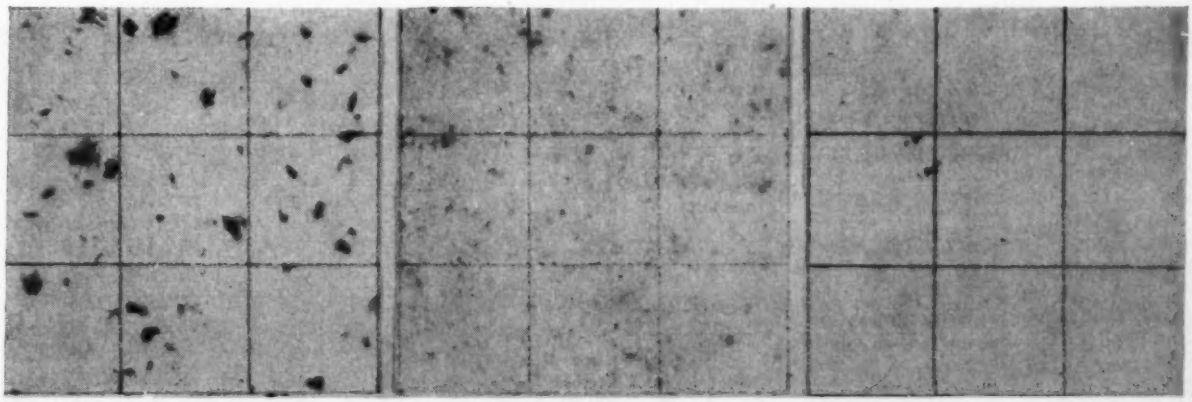


Fig. 4—Knot Count of Kraft Pulps. (A) Pulp from press, diluted to 32.5 per cent consistency and mixed in ribbon mixer 15 min.; 220 knots per gm. (B) Single pass through Rotapulper at constant consistency of 32.5 per cent; 763 knots per gm. (C) Pulp "B" after single pass through Rotapulper at constant consistency of 14.5 per cent; 4.2 knots per gm.

at constant consistency, and the resultant pulp was sampled for knot count. The pulp contained 56 knots per gram, about half of which appeared small and soft, indicating that very little further work would be needed to completely free the pulp from knots.

Another Rotapulper run was made on the mixer pulp. This time water was added through the bleach spray nozzles. Consistency entering the Rotapulper was 13.0 per cent, the exit consistency being 11.5 per cent. This water addition in the Rotapulper resulted in a knot count of 20. As in the previous run, a high percentage of the knots was small and soft.

The data indicated that consistencies of 11.0 per cent or lower might result in more efficient deknotting, but it was impossible to investigate lower consistencies. At consistencies lower than 12.5 per cent, water separated from the pulp on the belt feeder to the Rotapulper. The Shartle high-density pump would have fed the Rotapulper satisfactorily at any consistency up to about 12 per cent, but it could not be spared from its use at the retention tower.

Pulp from the bleaching run, previously described and containing 3795 knots per gram, was mixed with water for 15 min. in the ribbon mixer at a consistency of 12.5 per cent. The mixer reduced the knot count from 3796 to 217. A photo of one of the pulp sheets used in this knot count is shown in Fig. 1c.

The pulp was passed through the Rotapulper at a constant consistency of 12.5 per cent. This treatment reduced the knot count from 217 to 33 knots per gram. A sample of this pulp is shown in Fig. 1d.

Another Rotapulper run was made on the mixer pulp, using water in the bleach nozzles. Entering consistency was 12.5 per cent, that leaving being 11.5. Knot count of the resultant pulp was 26.

Sulfite pulp from mill C was processed in a manner very similar to that just described for groundwood. In this case, 15 min. dilution to 14.2 per cent consistency in the ribbon mixer had little effect on the knot count of 2800. This diluted pulp was passed through the Rotapulper at constant consistency with the result that the knots were reduced to 8 knots per gram. A sample of this pulp is shown in Fig. 3b. Fig. 3a shows the condition of the pulp before the Rotapulper treatment.

More of the mixer stock at 14.2 per cent consistency was passed through the Rotapulper, using water in the bleach nozzles. The exit consistency was 10.7 per cent. This treatment resulted in a knot count of 2.3. A sample of this pulp is shown in Fig. 3c.

The kraft pulp from mill E offered no problem in knot removal. During the bleach run it was found that the bleached pulp from the retention tower was free from knots. The small amount of pumping used in diluting the tower stock and pumping through the neutralizing chest broke down all knots in fiber. As a further check, however, some of the knotty pulp was diluted in the ribbon mixer for 15 min. at 14.5 per cent. One pass through the Rotapulper at constant consistency resulted in a knot count of 4.2. A sample sheet of this pulp is shown in Fig. 4c. When water was used in the bleach sprays, reducing the consistency from 14.5 to 13.0, the resultant knot count was 0.2.

Pulp Treatment for Knot Formation and Removal

Type Pulp	Condition of Pulp Before Treatment	Treatment	Consistency of Pulp (% O.D.)		Knot Count of Pulp (knots per O.D. gm)	
			Before Treatment	After Treatment	Before Treatment	After Treatment
Groundwood Mill B	Pulp pressed to 42.5% consistency, diluted in ribbon mixer to 28.1%, 15 min. mixing	Rotapulper	28.1	28.1	3460	1347
	One pass through Rotapulper at 28.1% consistency	Ribbon mixer for 15 min.	28.1	13.0	1347	686
	One pass through Rotapulper at 28.1%	Rotapulper	13.0	13.0	686	56
	followed by dilution to 13.1% and mixing 15 min. in ribbon mixer	Rotapulper	13.0	11.5	686	20
	Pulp pressed to 42.5% consistency	Rotapulper	42.5	33.0*	3460	3795
	Bleach run in Rotapulper, final consistency 33.0	Ribbon mixer and dilution 15 min.	33.0	12.5	3795	217
	Bleach run in Rotapulper followed by	Rotapulper	12.5	12.5	217	33
	dilution to 12.5% and 15 min. mixing in ribbon mixer	Rotapulper	12.5	11.5	217	26
Sulphite Mill C	Pulp pressed to 40% consistency, diluted to 25.8% and mixed 45 min. in ribbon mixer	Rotapulper	25.8	25.8	748	2800
	One pass through Rotapulper at 25.8%	Rotapulper	25.5	25.5	2800	3600
	consistency	Dilution in ribbon mixer 15 min.	25.5	14.2	2800	2800 (approx.)
	15 min. in ribbon mixer at 14.2% after	Rotapulper	14.2	14.2	2800	8.4
	1 pass through Rotapulper at 25.8%	Rotapulper	14.2	10.7	2800	2.3
	1 pass through Rotapulper at 14.2%	Rotapulper	13.1	13.1	84	1.6
	consistency	Rotapulper	13.1	11.0	84	0.8
Sulphite Mill D	Pulp pressed to 39% consistency	Rotapulper	39.0	31.5*	364	201
	Bleach run in Rotapulper, final consistency 31.5%	Dilution in ribbon mixer 15 min.	31.5	13.0	201	1.0
	Bleach run in Rotapulper, followed by dilution to 13.0% and mixing 15 min. in ribbon mixer	Rotapulper	13.0	13.0	1.0	1.2
Kraft Mill E	Pulp pressed to 40% consistency, diluted to 32% and mixed 15 min. in ribbon mixer	Rotapulper	26.0	26.0	220	763
	One pass in Rotapulper at 26% consistency	15 min. in ribbon mixer	14.5	14.5	763	4.2
		followed by one pass in Rotapulper	14.5	13.0	763	0.2

*Bleach solutions of the usual formulation were used in the Rotapulper, duplicating a normal bleach run.

Drum barking of turkey oak*

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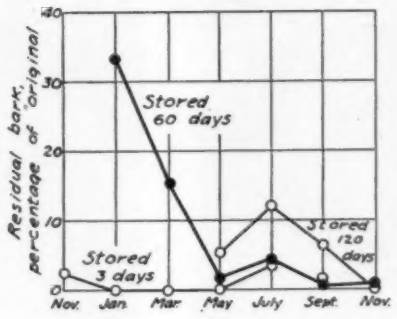


Fig. 1

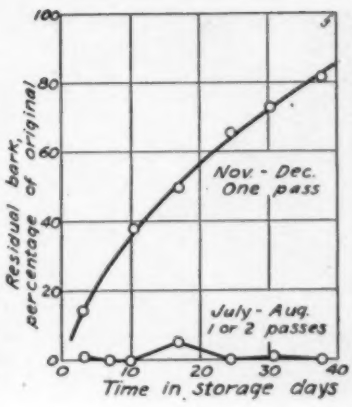


Fig. 2

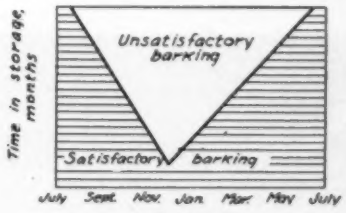


Fig. 3

TWO SETS OF barking experiments were designed to accomplish the objectives of this study. In one, bimonthly barking was conducted throughout the year on logs that were (1) freshly cut, (2) stored for two months, and (3) stored for four months. In the other, barking was conducted during the summer and winter on logs that were freshly cut and on logs that had been stored for 1, 2, 3, 4, 5, and 6 weeks. Forty-five logs were cut in each of the following months: November, January, March, May, July, September, and November; four or eight logs were cut weekly in November, December, July, and August.

The logs, which averaged 4.2 to 5.6 in. in diameter, were originally about 7 ft. in length; after samples for determination of moisture and bark content had been cut from each end, the final length was 5 ft., and the average weights of these ran from 42 to 74 lb. The average ages of the trees at the time of cutting were in the range of 28 to 42 years. The logs for bimonthly barking tests were divided into three groups of 15 each and were marked on the ends with colors and drilled holes. One group was barked immediately; the others were stored for periods of two and four months. For barking tests on the wood cut weekly, all the logs were stored until the last ones were cut; then all were barked together.

Barking was done in a commercial barking drum at the Palatka (Fla.) mill of the Hudson Pulp & Paper Co. For the bimonthly barking tests, a stop watch was started when all 45 logs were loaded on the conveyor to the drum; during the test a record was kept of the time the drum was down. When the logs emerged from the drum they were taken off the conveyor, identified, and put aside. Barking times and estimates of the percentage of bark remaining were recorded. Logs with less than 5 per cent residual bark were considered to be satisfactory; those with more than 5 per cent bark were returned to the drum for a repetition of the procedure, and none were barked for a third time. Residual bark, removed manually, was dried and weighed. A similar procedure was followed in the case of the logs that were cut weekly during November and December, but the logs were put through the barker only once.

Results

Fig. 1, a plot of the amount of residual bark on bimonthly cut logs versus the month of barking, shows that (1) logs cut in any month could be barked satisfactorily when the storage time was only three days, (2) logs cut from March to September and stored for 60 days could be barked about as satisfactorily as those cut in the same period and stored for only three days, (3) logs cut in November and January and stored for 60 days were not barked properly even after two passes through the drum, and (4) logs cut in January, March, and May and stored for 120 days were poorly barked in two passes, whereas those cut in July and stored for 120 days were barked as well as were the other logs that were tested with them. To summarize: barking was satisfactory except where the logs were cut in the winter and stored for two or four months.

Fig. 2, a plot of the residual bark on logs cut weekly as a percentage of the original bark versus the time in storage, shows that for logs barked during July and August (1) relatively good barking was experienced in all cases, and (2) the date of cutting caused greater variations in degree of barking than did the storage time. For logs barked during November and December, and given only one pass through the drum, barking times were nearly the same. The smooth curve indicates that resistance to barking increased gradually with increase in storage time.

Fig. 3, a plot of storage time against months in the year, summarizes the conditions that favored good drum barking of turkey oak.

Conclusions

Although no definite rules can be stated for proper barking of turkey oak, the following conclusions appear to be justified:

1. At any time of the year, logs barked within a week after cutting exhibited good barking characteristics.

2. Poor barking characteristics were experienced with logs cut in November and January after storage for two months and with logs cut in January, March, and May when stored for four months.

3. Good barking characteristics were observed in the case of logs cut in March, May, July, and September when stored for two months, and with logs cut in July and stored for four months.

4. Progressively poorer barking characteristics were noted for logs cut weekly in November and stored up to six weeks.

5. Good barking characteristics were experienced for logs cut weekly in July and stored for periods up to six weeks.

*Original paper presented in *Southern Pulp & Paper Manufacturer*, 17(6), 56 (1954).

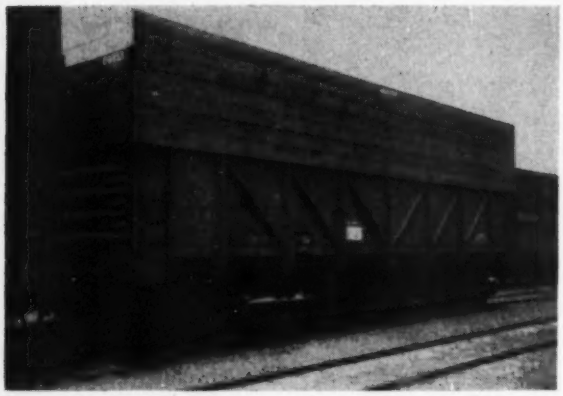


Fig. 1—Gondola type chip car of approximately 4000-cu. ft. capacity

Fig. 2—Converted automobile car of approximately 4200-cu. ft. capacity

Fig. 3—Chip rake for unloading converted automobile cars

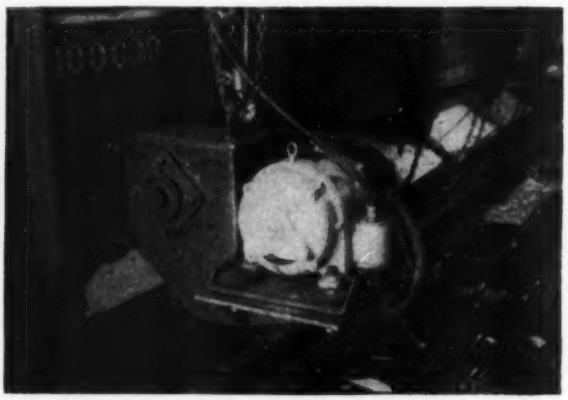


Fig. 4—Car shaker used on gondola type cars

Longview Fibre's "saved from waste" program

EDMUND ERICKSEN
Wood Procurement Engineer
Longview Fibre Co.

▶ About 85 per cent of Longview Fibre's pulpwood requirements come from sawmill and plywood plant residues — requiring a $1,000,000 capital investment in equipment for a well-integrated and streamlined operation.

ONE OF THE PRIMARY reasons for the location of Longview Fibre Co. was the nearby availability of large quantities of sawmill residues that had previously been burned. The Longview, Wash. firm manufactures pulp, paper and container board.

A container board machine, designed for a 100-ton daily capacity, commenced production in 1927, and all its wood requirements were met from waste collected at Long-Bell Lumber Co.'s nearby mill.

Continued growth over the past 27 years has resulted in a plant now producing approximately 750 tons per day on six machines. About 85 per cent of the wood requirement to produce the daily capacity is obtained from sawmill and plywood plant residues; the balance is obtained from farmer wood lot logs and hemlock logs purchased on the open market. The unit used by Longview Fibre is called a Bdu; it is the amount of wood which, when dry, weighs 2400 lb. Bdu is the abbreviation for "bone dry unit."

Cost of chipping installation

It is difficult to generalize concerning the costs of a chipping installation.

Fig. 5—Chip tractor and 10-unit trailer

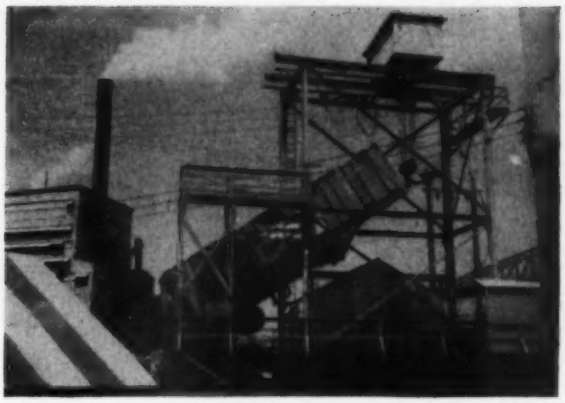


Fig. 6—15-ton hoist lifting the forward end of a trailer

Fig. 7—Moving chips from inside storage pile to mill by Dozermobile

Fig. 8—Chip weighing on track scale

A blockwood chipper, with a 250-hp synchronous motor, controls and a suitable screen, will cost approximately $25,000. A veneer chipper, operating with 50 hp, will cost about $10,000, and a screen for this type of chipper will range from $1500 to $4500. Considerable additional expenses are encountered in moving wood to the chipper, conveying chips from the screen to a loading site, and in constructing adequate loading facilities. These costs may amount to as much as $30,000 or $40,000.

Quantity of available chips

At the present time, Longview Fibre has 34 contract chip suppliers, of which half are sawmills and half veneer and plywood plants. The quantity of chips produced by a sawmill will vary considerably, depending on log grades, mill cutting practices and fuel requirements. A typical Douglas fir sawmill without a whole log barker will average about 0.2 Bdu per 1000 ft. of logs cut (deck scale). Whole-log barking generally doubles chip production per 1000 ft. Generally, sawmills cutting less than 10,000 bd. ft. of Douglas fir per shift have insufficient suitable wood residue to warrant the high cost of a chipper installation. The volume of chips produced by a veneer plant will also vary, depending primarily on fuel requirements for power and veneer drying. The typical veneer or plywood plant will produce an average of 120 Bdu per 1,000,000 sq. ft. of peeled veneer (⅜-in. basis). The minimum size veneer or plywood plant that warrants a chipper installation is one making about 30,000,000 sq. ft. (⅜-in. basis) annually.

A Longview Fibre owned and operated chipping plant at Eugene produces an average of 120 Bdu daily. Suitable wood, in 4- to 20-ft. lengths, is purchased from nearby sawmills and veneer plants through wood dealers, chipped, and transported by rail to Longview.

Approximately 75 per cent of the chips from 35 suppliers are transported to Longview in specially equipped railroad cars. At the present time, more than 450 cars are assigned by five common rail carriers to Longview Fibre for chip service. This equipment is used to transport chips within a 50- to 260-mile range of Longview.

Type of rail cars and equipment

Rail cars are of two general types. The standard 40-ft., center hinged, drop bottom gondola, which has extented wooden sides, giving an overall height from top of rail of approximately 15 ft., has a capacity of about 4000 cu. ft. (Fig. 1.) The other type, which is a 50-ft. over-aged automobile car with roof removed, a slope sheet in each end, and nine doors cut in each side, has a capacity of about 4200 cu. ft. (Fig. 2). The automobile car is divided into three sections, each being equipped with a rake or plow that is pulled crosswise to aid chip unloading (Fig. 3). Two removable vibrators, attached near opposite corners of the gondola cars, are used as chip unloading aids (Fig. 4). While on the average 37 rail cars are being unloaded in 24 hours, as many as 46 have been unloaded in a similar period.

Fig. 9—Mechanical chip sampler. Sample is taken every 10 seconds

Fig. 10—Chip weighing before and after drying to determine moisture content

A fleet of 10 tractors and 25 ten-unit trailers is used to transport chips within the 30- to 50-mile range of Longview where rail loading facilities are not available or where transit time would be excessive. Truck chips are unloaded by raising the forward end of the trailers with a 15-ton hoist (Fig. 6).

In order to equalize receipts with usage, a large reservoir is necessary. Chips received by rail may be trucked from the unloading pit to a surfaced, open storage area having a capacity of approximately 25,000 Bdu. When required, chips in the storage area are returned by bulldozer to the rail unloading pit for further conveyance to the pulp mill (Fig. 7). Additional storage facilities are provided by four silos, each having a capacity of 400 Bdu. These silos are both loaded and unloaded by a system of belt conveyors.

Fig. 11—General view of mechanical chip sampler

Quantity and quality evaluation

The 2400- lb. Bdu, determined from experiments conducted in 1926, is equivalent to the bone dry weight of wood in a 128-cu. ft. cord of closely piled fir sawmill wood waste. Over the past 27 years, the Bdu has been the unit of measure used in the purchase of approximately 2,000,000 Bdu by Longview Fibre from Long-Bell Lumber at Longview. In the past year, a number of new chip agreements have been entered into with sawmills and plywood plants, in which a Bdu is the specified unit of measure.

Realizing the responsibility for making accurate weight and moisture determinations, Longview Fibre has installed a 70-ft. Fairbanks-Morse track scale of 250,000-lb capacity, on which rail cars and trucks are weighed (Fig. 8). Moisture sampling equipment consists of a specially designed mechanical sampler that gives a representative sample of each carload of chips as it is being unloaded (Figs. 9 and 10). This sample is dried in a J. O. Ross oven having a capacity of 24 sample trays in each of three sections (Fig. 11.) Moisture is determined by weighing the chip sample before and after drying on a Toledo scale that gives readings in hundredths of a pound (Fig. 12). The weighing and moisture sampling is controlled by men specially trained for that purpose, whose sole duty is chip quantity and quality evaluation.

A $1,000,000 capital investment

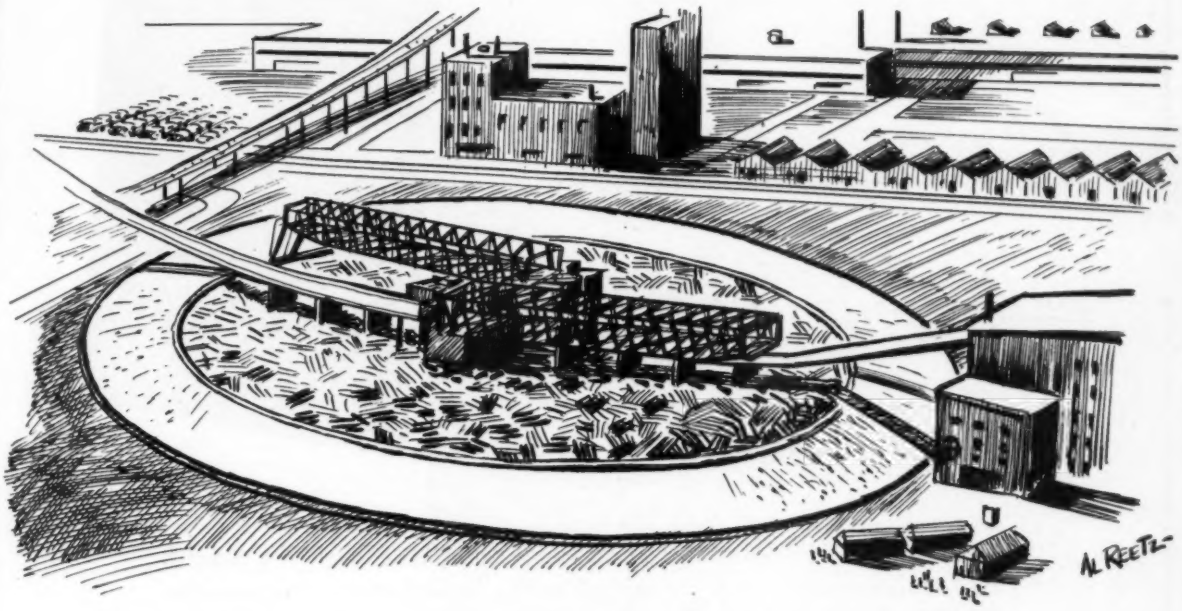
The procurement program, involving the various phases of contracting, transporting, unloading and delivering either to storage or use of nearly 300,000 Bdu a year, or about 15,000 carloads, requires a very substantial capital investment on the part of both the producer and the consumer of chips.

The conversion of rail cars averages about $700 per car, or for the 462 cars a total of $325,000. To this must be added the cost of the fleet of tractors and trailers, the rail and truck unloading facilities, silos and blacktopped open storage, some 5,000 ft. of rail track capable of holding several hundred cars, as well as elaborate weighing and sampling equipment. The investment in this equipment is about $1,000,000.

The development of a wide variety of chipping facilities to fit varying types of sawmills and plywood operations, economic transportation methods, suitable materials handling equipment, as well as the perfection of technique for properly measuring, evaluating and using CHIPS SAVED FROM WASTE constitutes a major step toward the achievement of full utilization of our Northwest forests.

Fig. 12—Chip drying oven

PAPER SKETCHES

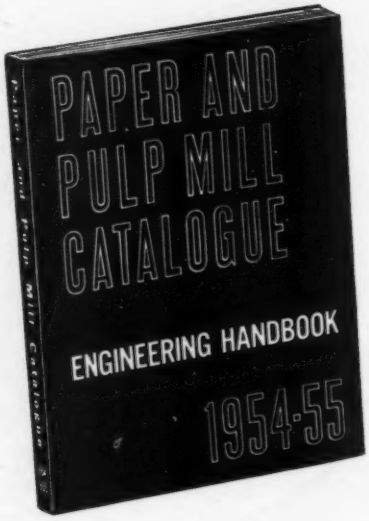


30,000 cords of PULPWOOD are stored underwater by a Tennessee mill in this mammoth "log pond" measuring 500 ft. across the top. Underwater storage retards decay and permits the mill to furnish a year-round market to farmers for their pulpwood.

To prevent damage to cutter knives, an army mine detector is being used by a Wisconsin paper company to detect rifle bullets and shrapnel pieces in pulpwood originating near the firing range at Camp McCoy, Wisc. The wood containing shrapnel is used to light fires in the company's recovery boiler.

As early as 1538, the master papermakers of Troyes, France, were required by law to so watermark their sheets that buyers could tell instantly, the exact quality of paper they were buying.

Get acquainted with your New...



Spend a few minutes today to get acquainted with the wealth of helpful information contained in this brand new edition of the PAPER AND PULP MILL CATALOGUE. Compiled expressly for this industry, it can save you hours of time throughout the year. Check the following features . . .

1. The BUYERS SERVICE SECTION — a list of over 4600 items used in your mill with listings of who makes them.
2. An INDEX OF TRADE NAMES of machinery, equipment and materials.
3. Addresses of the firms who make these items.
4. Descriptive catalogue pages of the products of the leading suppliers of these products.
5. The famous ENGINEERING HANDBOOK with its 142 pages of useful data, graphs, charts, tables and reference material. It has been estimated that it would require a reference library of several hundred technical books to locate the information found in this handbook.

THEN . . . keep it handy on your desk.
Its use will repay you many times.

FRITZ PUBLICATIONS, INC.

431 South Dearborn Street **Chicago 5, Illinois**

ALLIED NEWS

Cleaver-Brooks Plans Canadian Operations

Cleaver-Brooks Co. of Milwaukee, manufacturer of steam and hot-water boilers, has announced the establishment of manufacturing arrangements in Canada. The first boiler units produced (30 hp and 40 hp) will be followed early next year by the production of sizes through 125 hp.

All boilers will be constructed according to Canadian codes and will be Canadian Standards Association labeled.

Canadian C-B representatives are as follows: H. F. Clarke & Co., Calgary and Edmonton, Alberta; Sanitherm Engineering Ltd., Vancouver, B. C., and the Yukon Territory; Fort Garry Agencies Ltd., Winnipeg, Man.; E. S. Stephenson & Co. Ltd., St. Johns and Halifax, N. S.; Waterloo Mfg. Co., Toronto and Waterloo, Ont., and Mechanical Appliance & Transmission Co., Montreal, Que.

American Sulphur Acquires Standard Oil Process

American Sulphur & Refining Co. of Beverly Hills, Cal., has acquired from Standard Oil Development Co. exclusive license to the latter's process covering the extraction of sulfur from surface ores.

The process, which is said to be an improved, lower-cost method of extraction by solvents, will open to profitable production large surface deposits that have been unprofitable under present prices.

HIGH FREQUENCY induction furnaces recently installed by Sandusky Foundry & Machine Co. of Sandusky, Ohio. The expansion program extends the products of the firm beyond the non-ferrous field for the first time and will make possible the manufacture of centrifugal castings in a wide range of both ferrous and non-ferrous compositions and alloys

Allied News Notes

Ground has been broken for the $2,000,000 plant of the Bridgeport Thermostat Div. of **Robertshaw-Fulton Controls Co.** at Milford, Conn. Products will include metal bellows and controls utilizing bellows. Completion is scheduled for June 1955.

Chain Belt Co. of Milwaukee has opened three new district sales offices: at Charlotte, N. C.; Cincinnati, Ohio and Moline, Ill.

Dow Chemical Co. has expanded facilities for latex research and development at its Midland (Mich.) Div. Under the direction of J. W. Britton, the unit includes a research laboratory.

Hooker Electrochemical Co. has purchased a barge, "HECo I," for transporting liquid caustic soda in bulk to customers on the inland waterway system in the Chicago area. The 175-ft. vessel was fabricated by Dravo Corp.

Foster D. Snell Inc. has announced its fourth expansion since 1947. The new acquisition is leased space at 42 West 15th St., New York, N. Y. The Chemical Market Abstracts and Engineering departments will use the new location.

Patton Mfg. Co. Inc. has announced the addition of a Paper Mill Div., which will concentrate on the development of special machinery and related accessories for the paper industry. Patton Mfg. is located at Springfield, Ohio.

Sales representatives of **Wisconson Wire Works** recently attended a two-week extensive sales and training conference at the home office in Appleton, Wis.

Marcus Transformer Co. has transferred its manufacturing operations to an enlarged plant in Rahway, N. J. The move consolidates under one roof the operation of two former plants in Hillside, N. J.

Northern Engineering Works, manufacturer of overhead traveling cranes, electric hoists and material handling equipment, has completed a building expansion at its Detroit plant.

Allied Personalities

Max Willemin has been named western sales manager for Electrofilm Inc. of North Hollywood, Cal., manufacturer of solid film lubricants and film-type heating elements.

Stuart Edgerly has been appointed manager of the newly formed industrial sales division of Fenwal Inc. of Ashland, Mass. He will administer the sales of industrial temperature controls through the firm's 32 field offices.

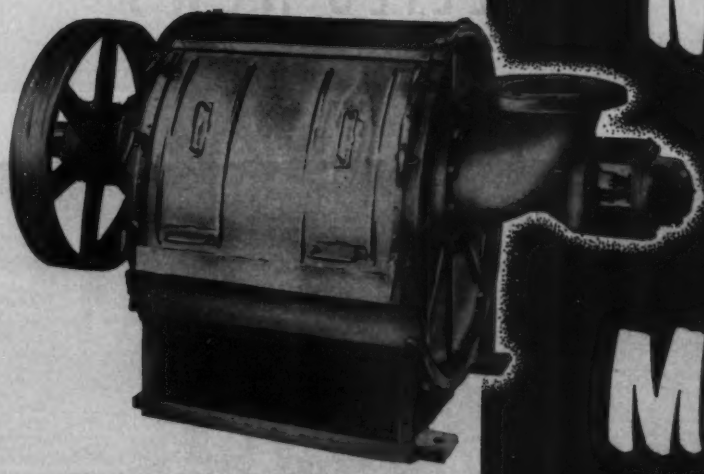
S. J. Stowell has been named sales manager of Tranter Mfg. inc., Lansing, Mich. He has been merchandise manager since 1953 for the manufacturer of refrigeration equipment and heat transfer units for industry.

Charles F. Sanborn, manager of Wyandotte Chemicals Corp.'s M. A. Div., Market Research Department, has been promoted to senior sales representative in the firm's eastern district office with headquarters in New York, N. Y.

C. F. Sanborn

O. C. Tate

Oliver C. Tate has been appointed executive assistant chief engineer for John B. Kohler, Crystal Lake, Ill. consultant and machine design specialist for the paper and paper converting industries.



The "Junior" Screen . . . smallest of *three* units producing from 35 to 150 tons per day, respectively.

Money Saving Midgets

Cowan Centrifugal Pulp Screens by

APPLETON MACHINE COMPANY

Added efficiency, greater economy are the watchwords for *Appleton Machine Company's* junior versions of the standard Mark "A" Cowan Centrifugal Pulp Screen, acknowledged as outstanding in its field.

The Mark "E" Screen is a half-sized model of the standard Mark "A", conservatively rated at a capacity of 2400 U.S.G.P.M. accepted stock. 50 h.p. is required to operate the Mark "E", but its drive is designed to accommodate a 60 h.p. motor, wherever needed. The Mark "E" is particularly advantageous in smaller mills, or as a supplementary screening unit. Also, installing two Mark "E" Screens—instead of a single larger machine—provides a definite safety factor in case of breakdown.

The "Junior" Screen is a quarter-sized model of the big Mark "A", with a rated capacity of 1400 U.S.G.P.M. accepted stock. 25 h.p. operates the "Junior" Screen, but it will handle motors up to 40 h.p. Greatest applications are as secondary screening units, and as a primary screen for mills producing a variety of pulp grades which require a system made up of small, separate units.

Performance of these two Cowan Screens is comparable in every way to that of the standard Mark "A" Screen . . . the same high consistency screening . . . low percent rejects . . . good fiber separation . . . low shower dilution pressure . . . top hydraulic efficiency. Typically sound *Appleton Machine* construction plus a protective coating tailored to fit your needs *complete* your assurance of long-time satisfaction.

CUSTOM-BUILDERS OF PULP & PAPER MILL MACHINES
WINDERS • FINISHING ROLLS • REWINDERS

ASSOCIATION NEWS

300 Attend New York-Canadian Fall Meeting

About 300 delegates—mostly from New York, Quebec and Ontario—attended the annual fall meeting of the New York-Canadian Div. of the Superintendents Association. The gathering was held September 2-4 at the Saranac Inn in Upper Saranac Lake, N. Y. Chairman of the sessions was R. E. Grey of Lockport Felt Co.

In addition to the technical talks, the program included mill visits to J. & J. Rogers Co., Au Sable Forks, N. Y.; Newton Falls Paper Mill Inc. Newton Falls, N. Y.; the Diamond Match Co., Plattsburg, N. Y.; Imperial Paper & Color Corp., Plattsburg, N. Y. and New York & Pennsylvania Co. Inc., Willsboro, N. Y.

1954-55 officers of the division are: President—George S. Carroll, general superintendent of Newton Falls Paper Mill; first vice chairman—J. E. Carruthers, mill manager for Interlake Tissue Mills Co. Ltd., Merritton, Ont.; second vice chairman—T. F. LaHaise, paper mill superintendent for Imperial Paper & Color, and third vice chairman—L. J. Smith, mill manager for St. Regis Paper Co. at Harrisville, N. Y.

Technical papers were presented on the following subjects: "Bird Vibrotor High Density Screening," by Sven Fahlgren of Bird Machine Co.; "Drop-in-Pressure Device for Paper," E. P. Troland, also of Bird Machine; "The Use of Instruments at Newton Falls," Alfred Wagner of Newton Falls Paper Mill, and "Selling Materials Handling to a Conservative Industry Manager," William S. Wheeler of Wheeler Associates Inc.

1954-55 OFFICERS OF the Ohio Section of Tappi gather during the annual Ladies Night to receive the congratulations of the national president, George Pringle, vice president of the Mead Corp.; with Mr. Pringle are (front row l to r): George Gregg of Cincinnati Gas & Electric Co., treasurer; William Aiken of the Gardner Board & Carton Co., vice chairman; Mr. Pringle; Harold R. Joiner of the Champion Paper and Fibre Co., new sectional chairman, and Donald Jenkins of Champion, corresponding secretary; the new executive committee members are (rear row l to r): Herbert Smith of Mead, John Clouse of Oxford Miami Paper Co., Don Goodman of Sorg Paper Co. and John Nolan of Sorg

Paper Coatings Discussed at Empire State Tappi

Walter L. Hardy director of engineering for Foster D. Snell Inc., was the principal speaker at the September 14 meeting of the Metropolitan District, Empire State Tappi. His subject for the group's first gathering of the 1954-55 season was "Practical Examples in the Development of Paper Coatings."

The speaker pointed out that the numerous raw materials now available to the coating formulator permit the production of practically limitless variations in the functional properties of coated and laminated papers. The big problem, he said, often is to arrive at some compromise when a series of functional properties are required in one sheet.

Mr. Hardy described briefly some of the new materials available and, in more detail, how they are applied to produce pre-determined properties in the finished product. Included were methods to produce grease resistance, high and low water-vapor and selective gas permeabilities, wet strength, light resistance, etc.

Coming Events

TAPPI

Oct. 18-21—Ninth Engineering Conference, Benjamin Franklin Hotel, Philadelphia

Nov. 8-9—Fibrous Agricultural Residues Conference, National Regional Research Laboratory, Peoria, Ill.

Nov. 12-13—Southeastern Section, King & Prince Hotel, St. Simons Island, Ga.

Nov. 17-19—Corrugated Containers Conference, DeSoto Hotel, Savannah, Ga.

Dec. 10—Delaware Valley Section, Engineers' Club, Philadelphia

Feb. 21-24—Annual Meeting, Commodore Hotel, New York, N. Y.

American Pulp & Paper Mill Superintendents Association

Nov. 16—Miami Valley Division, Alms Hotel, Cincinnati

Dec. 3-4—Pacific Coast Division (annual meeting), New Washington Hotel, Seattle

Other meetings

Oct. 18-22—42nd National Safety Congress and Exposition, Pulp and Paper Section, Conrad Hilton Hotel, Chicago

Oct. 20-22—American Management Association, Office Management Conference, Hotel Astor, New York, N. Y.

Nov. 3-5—American Management Association, Finance Conference, Roosevelt Hotel, New York, N. Y.

Nov. 10-12—American Management Association, Insurance Conference, Palmer House, Chicago

Nov. 11-13—Dechema, 1954 Corrosion meeting, Frankfurt a.M., Germany (ten lectures to be presented)

Nov. 15-17—American Standards Association, Fifth National Convention on Standards, Hotel Roosevelt, New York

HAM FELTZ says:

Examine sheet after sheet of Hammermill's fine papers for business and advertising use. Look closely through the entire line of weights and colors—it's dollars to doughnuts you will not find a felt mark.

How come? Well, Hammermill uses felts with such perfect weave, such soft, deep nap, that there isn't a chance that there can be any felt marks. And, because there are no felt marks on Hammermill papers, there is no way to tell what makes of felts they use.

I've got a hunch that HAMMERMILL **uses lots of**

MIAMI WOOLEN MILLS

Established 1858

Hamilton Felts

SHULER & BENNINGHOFEN, HAMILTON, OHIO

NAMES *in the* NEWS

A. E. H. Fair New Vice President of Brown

A. E. Harold Fair, president of Alliance Paper Mills Ltd. and long associated with the Canadian pulp and paper industry, has accepted a position as executive vice president of Brown Co. in Berlin, N. H., and Brown Corp. of La Tuque, Que.

Mr. Fair is an engineer and fellow of the Chemical Institute of Canada. He has served on the executive board of the CPPA, is a past president of the Ontario Pulp & Paper Makers Safety Association, a director of the Ontario Forest Industry Association, and is a member of the executive board of Tappi.

A. E. H. Fair

Robert Crane

Byron Weston Appoints Crane Executive V.P.

At a recent directors meeting, Robert Crane was elected executive vice president of Byron Weston Co., Dalton, Mass. He will be in charge of the firm for the term of the late president, Hale Holden, who died June 30.

Mr. Crane joined the organization in 1929 as a salesman and for many years was in charge of the New York, N. Y. office. He was called to the mill in 1940 to assume the responsibilities of sales manager and later the same year was elected director and secretary. In 1942 Mr. Crane became vice president in charge of sales.

St. Regis Advances Ferguson

Promotion of John K. Ferguson as assistant to Edward R. Gay, executive vice president of St. Regis Paper Co., was announced September 2. Mr. Ferguson, who was formerly resident manager of the Jacksonville, Fla. kraft pulp, paper and board mill, was to be transferred to the New York, N. Y. office September 13.

J. K. Ferguson

J. A. McDermott

Appointment of John A. McDermott, presently general superintendent in Jacksonville, as mill manager was also announced by the company.

Mr. Ferguson has been with St. Regis since 1947 and resident manager in Jacksonville since 1950. Prior to 1950 he was with the firm's Pensacola operations and at one time had been located at the Fargo, Ga. forestry center.

In another St. Regis appointment, U. J. Westbrook was made supervisor of all the firm's pulp mills. He was formerly kraft pulp and paper production manager for the southern division (Jacksonville and Pensacola). He joined the firm in 1941 at Pensacola, was made Pensacola general superintendent in 1950 and southern division production manager in 1952.

Kalamazoo changes

St. Regis has also reported several changes at its Kalamazoo, Mich. operations.

William E. Caldwell Jr., formerly manager of the Panelyte plant at Trenton, N. J., has been appointed resident manager of all the firm's Kalamazoo operations. (These include the printing, publication and converting paper mill and the decorative Panelyte plant.)

Joseph H. Torras becomes assistant resident manager at Kalamazoo. Leonard A. Pierce Jr., resident manager of the paper mill, joins the staff of William R. Adams, St Regis vice president for manufacturing.

James E. Kussmann, who has been Panelyte plant manager at Kalamazoo, becomes assistant manager of the Tacoma, Wash. kraft pulp and paper mill.

Succeeding Mr. Caldwell as plant manager at the Trenton Panelyte operation is Andrew Repas.

Marathon Names Spalding to Succeed Roy Kelly

John E. Spalding, for the last three years general paper mill superintendent at Oswego, N. Y., has been made chief paper mill superintendent for Marathon Corp. He succeeds Roy H. Kelly, who retired August 31 after 42 years of service with the firm.

Mr. Spalding joined Marathon in 1947 as a process engineer at the Menasha, Wis. plant, later becoming supervisor of the central manufacturing process engineering section. He is now assigned to the corporation's central manufacturing staff in Menasha.

A member of the Superintendents Association and Tappi, Mr. Spalding was formerly a research and teaching assistant at the Institute of Paper Chemistry. He was at one time employed by Oxford Paper Co.

Mr. Kelly joined Marathon in 1912 as a machine tender following employment with Falls Mfg. Co. and Munising Paper Co. In 1917 he was made night superintendent at Rothschild and machine superintendent in 1918. He was advanced to general superintendent of the Rothschild pulp and paper mill in 1920 and resident plant manager in 1946. Mr. Kelly was named chief paper mill superintendent two years ago. He is a trustee of the Superintendents Association, of which he served as president in 1932.

Mando Reports Changes at International Falls

Changes in the management of the International Falls (Minn.) Div. of Minnesota & Ontario Paper Co. have been announced by C. Larson, vice president in charge of production.

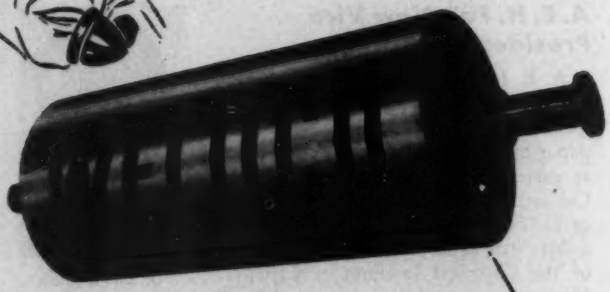
William H. Schlafge, formerly production manager of the Paper Div., has been named International Falls general manager; Fred E. Boeckh,

For CORROSION-RESISTANT ROLL COVERS

WELDCO ALWAYS GETS FIRST CALL!

Both new and old rolls, covered by the patented Weldco "Pressure Welding" process, resist corrosion, withstand abrasion, and give long, economical service with a minimum of maintenance. That's why so many Weldco rolls are used in pulp and paper, textile, food, and chemical plants from coast to coast. The Weldco process, using Monel, Stainless Steel, Nickel, Inconel, and other alloys, can be applied to new or reclaimed rolls, eliminating the cost of new cores and providing substantial operating economies.

Investigate this patented process that's not an electroplate ... not a sprayed coating... but a solid layer of rolled metal, applied to the base roll uniformly and tightly. Let Weldco's roll specialists advise you on the best materials for your roll and processing requirements.



Other WELDCO Products Include: Alloy Pipe and Tubing, and Fabricated Piping

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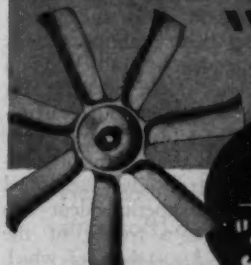


NEW *Aerovent* "Semi-Pressure" FANS

7-Blade "Machete" Airfoil Propeller

Now get top efficiency against resistances to 4½" SP *without* special equipment! Standard Aerovent units with new 7-blade propellers move more air at *slower* motor speeds with *less* horsepower. Write for folder.

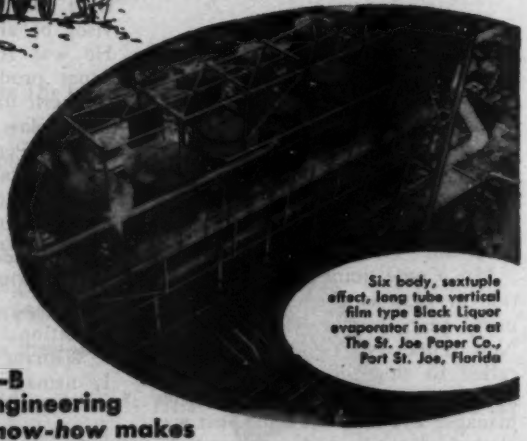
Ask for bulletin S-50!

All Aerovent Fans are rated in accordance with the Standard Test Code and U.S.D.C. Comm. Std. CS178-51.

Aerovent Fan Company, Inc.

Ash and Blane Streets Piqua, Ohio

Longer Runs between "BOIL OUTS"!



Six body, sextuple effect, long tube vertical film type Black Liquor evaporator in service at The St. Joe Paper Co., Port St. Joe, Florida

G-B Engineering *know-how* makes the difference!

for, GOSLIN-BIRMINGHAM DESIGN ENGINEERS are also practical plant men with an understanding of plant and process problems. Thus, they are able to combine process knowledge with sound engineering practice to accomplish desired results in any given condition.

THERE IS NO SUBSTITUTE FOR EXPERIENCE

GOSLIN-BIRMINGHAM MANUFACTURING CO., INC.

BIRMINGHAM • ALABAMA

formerly Insulite production manager, becomes assistant general manager.

In another move, the responsibilities of Paul A. Bartholomew, technical director, were extended to include the direction of technical control for both the Paper and Insulite divisions.

Mr. Schlafge has been with Mando 24 years, having previously served as a chemist for E. I. du Pont de Nemours & Co. and Strutwear Co. His first employment by Mando was as head chemist at the Minneapolis plant of the National Pole & Treating Div. He was made production manager of the Paper Div. in 1951.

Mr. Boeckh was originally employed by Mando as a laboratory tester in 1928. Following associations with Burlington Basket Co. and the U. S. Forest Service, he returned to Mando in 1937 as assistant superintendent of the Insulite Div., becoming general superintendent in 1943 and production manager in 1951.

Mr. Bartholomew joined Mando in 1949 after employment by Hercules Powder Co. and Hawthorne Paper Co. His first employment with Mando was as assistant sales manager of the Paper Div. He was transferred to International Falls as technical director in 1951.

W. H. Schlafge

P. A. Lundberg

Paul A. Lundberg was recently appointed senior industrial engineer for Minnesota & Ontario Paper Co. at International Falls, Minn. Formerly with Scott-Atwater Mfg. Co., he will be assigned to work on the modernization of the Insulite production department.

Mill Vets Retire

Two veteran employees of paper mills in Wisconsin retired in July. Ted Weber, second oldest employee of Combined Locks Paper Co., retired after almost 55 years of service, and Emil Giordana has retired from active work at Thilmany Pulp & Paper Co. after 37 years.

Mr. Weber was boss machine tender at Combined Locks until 25 years ago when defective eyesight required a transfer to the wrapping section of the finishing room, where he remained until his retirement. Mr. Giordana joined Thilmany in 1917. He worked with the construction crew for 30 years and for the last seven as a millwright. Mr. Weber is 72 years old.

Names in the News . . .

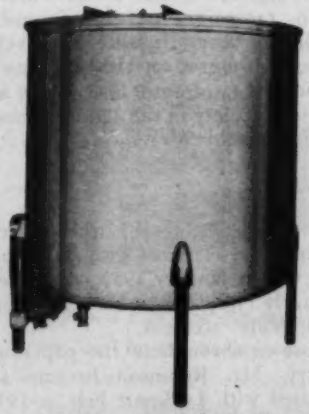
Milan Boex, vice president and director of Marathon Corp., has been elected to the board of trustees of Lawrence College, Appleton, Wis.

George J. Lockbaum has been named paper mill superintendent at Scott Paper Co.'s mill in Everett, Wash. Currently staff technical papermaking advisor, he joined Scott in 1930.

Robert W. Stevens, prominent Los Angeles paper mill consultant,

P&R THE ULTIMATE IN STAINLESS STEEL

TANKS



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✓ SANITARY
Ideal for
STORING
WETTING
BLEACHING
COLOR REMOVAL

The Right Tank for Every Purpos ɜ

In countless processes in pulp and paper mills, P & R stainless steel tanks and stainless steel fabrications serve the need better. Best materials . . . best workmanship . . . best price. These tanks are available in all sizes, types, shapes . . . jacketed, vertical, horizontal . . . with or without agitators, valves, lids or motors. The gleaming stainless steel surface of P & R tanks is smooth, corrosion resistant, and easier to clean. It will give you years of practical, efficient service — at a cost that is surprisingly low.

- Rounded bottoms for sanitation.
- Side mounted legs.
- Flush type sanitary stainless steel drain valves.
- Inclined bottoms for complete drainage.
- Splash proof.

REPRESENTATIVE WANTED To Handle Exclusive Territories.

WRITE FOR FURTHER INFORMATION.

POTTER & RAYFIELD, INC.
ENGINEERING CRAFTSMANSHIP
P. O. Box 1943
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Names in the News . . .

PARTNERS IN POWER—In July of 1910 Leo Wiley was assigned to the maintenance of General Electric hydro-generator No. 85915, which had been installed five years before at the Island Mill power house of what is now International Paper Co. in Ticonderoga, N. Y. The relationship was successful. The above photo shows Mr. Wiley, now electrical superintendent, checking the condition of the original installation

left recently for Sweden in his capacity as American consultant to Fiskeby Fabriks A. B. of Norrkoping. He attended the formal opening of the mill for which he served as construction consultant.

Robert J. Carroll has been named assistant treasurer of International Paper Co. to succeed the late P. J. Sullivan. Mr. Carroll has held a similar post with Canadian International Paper Co. at Montreal.

R. J. Carroll

J. R. Jones

John R. Jones, a 1954 honor graduate of the Michigan State College school of forestry, has received the 1954-55 Minnesota & Ontario Paper Co. Forestry Research Project award. This year's fellowship at the University of Minnesota will be used to determine the amount and kind of damage to young trees in harvesting.

NECROLOGY

Frank Schneller

Frank Schneller, 77, retired vice president of Gilbert Paper Co. of Menasha, Wis., and widely known in veterans affairs, died September 12 at Hines Veterans Hospital in Chicago.

A veteran of two wars, Mr. Schneller had retired from Gilbert Paper 17 years ago. He was former Wisconsin department commander of the American Legion and in 1948 was national commander of the Military Order of the Purple Heart.

His long military record began in 1896, when he enlisted in the 3rd Wisconsin for service in the Puerto Rican campaign of the Spanish-American War. He served actively and as a reserve in the Wisconsin National Guard until 1917, when he applied for duty in the 32nd Division during World War I.

L. J. Robinson

Lester J. Robinson, who retired from active service with Lockport Felt Co. in January 1953, was killed instantly July 16 in a California automobile accident.

Known throughout the paper industry, Mr. Robinson became associated with Lockport Felt in 1914 and at the time of his retirement was their administrative and technical consultant.

B. M. Lewis

Bert Marshall Lewis, 66, general manager of Nicolet Paper Corp., died September 11 in DePere, Wis.

Born in Montpelier, Ind., Mr. Lewis devoted most of his life to the glassine paper industry. He was employed successively by Hartford City Paper Co., Riegel Paper Corp., Glassine Paper Co., and Seaman Paper Co. He joined Nicolet Paper in 1932 as sales manager and was made general manager in 1948.

J. M. Jager

John M. Jager, 77, superintendent of Kalamazoo Paper Co. for several years before his retirement in 1943, died August 29 at his Kalamazoo home.

A native of the Netherlands, Mr. Jager had been a resident of the Michigan city for 70 years. He had been employed by Kalamazoo Paper 53 years.

E. B. Lambton

Ernest B. Lambton, 62, safety engineer for St. Regis Paper Co., died September 12 in Jacksonville, Fla.

Prominent in accident prevention work, Mr. Lambton was active in the Pulp & Paper Section of the National Safety Council. He was secretary and membership chairman of the group during 1952 and 1953.

Prior to joining the St. Regis staff, he was a member of the executive board of the International Brotherhood of Paper Makers (AFL).

Henry Harris Tozier

Henry Harris Tozier, paper expert and one of George Eastman's earliest associates in Eastman Kodak Co., died August 20 in Rochester, N. Y. He was 80.

Mr. Tozier joined Eastman Kodak in 1900, heading the paper and emulsion departments at Nepera. He was later transferred to the Rochester plant, where he was made superintendent of the paper sensitizing department. Later he served as assistant general manager of Canadian Kodak Co. Ltd., retiring in 1941.

M. C. Maxwell

M. Craig Maxwell, former superintendent of paper manufacturing at Moore & Thompson Paper Co. in Bellows Falls, Vt., died July 31 at the age of 85. He was one of this country's oldest papermakers and a life member of the Superintendents Association.

A native of Franklin, Ohio, Mr. Maxwell served for more than 30 years as superintendent of the former McDowell Paper Mills in Manayunk, Pa. He joined Moore & Thompson in 1942, retiring in 1950.

K. H. Snyder

Kenneth H. Snyder, industrial and community relations manager for the Ohio Division of the Champion Paper & Fibre Co. since 1951, died August 7.

Mr. Snyder became associated with

the Hamilton, Ohio firm in 1927, devoting a major portion of his career to personnel work. Prior to assuming the post he held at the time of his death, he had served as the division's training supervisor, later as the assistant industrial and community relations manager.

Ralph B. Knott

Ralph B. Knott, vice president and treasurer of Fibreboard Products Inc., died recently at Hillsborough, Cal. He was 55. A national director of the National Association of Cost Accountants, Mr. Knott was also past president of its San Francisco chapter and a vice president of the Controllers Institute of America.

James Pattison Nicol, 59, manager of industrial relations for Gair Co. (Canada) Ltd., died recently. A native of Scotland, Mr. Nicol came to Canada in 1913 and joined the staff of Ontario Paper Co. Ltd. He was former vice president of the International Brotherhood of Paper Makers and was one of the founders of the Niagara District Council of the Paper Mills Union.

Earl G. Hayner, 68, retired head of the orders department of West Virginia Pulp & Paper Co. at Mechanicville, N. Y. died recently.

Alan C. Dunham, 68, West Coast representative for Lockport Felt Co., died September 3 at his summer home in British Columbia. He joined the Lockport staff in 1928.

Fred A. Rose, 82, for 30 years superintendent of the box division of the former Memphis Paper Co., died at his Florida home August 9. A native of Ireland, Mr. Rose had retired about 30 years ago.

Robert Rankin, 50, industrial consultant formerly associated with Anglo-Canadian Pulp & Paper Mills Ltd., died in Montreal August 14.

Vernon B. Case, 60, vice president of Paper Makers' Importing Co. at Easton, Pa., died August 20 while in Syracuse, N. Y., on a business trip. A member of the importing firm 38 years, Mr. Case became vice president 10 years ago.

William O. Mercer, chief inspector for Downingtown Mfg. Co. at Downingtown, Pa., died September 9. He was 66 and had been associated with the firm for over 50 years.

Canadian paper manufacturer reports LATTICE BRAID* Packing reduces shaft wear on centrifugal pumps

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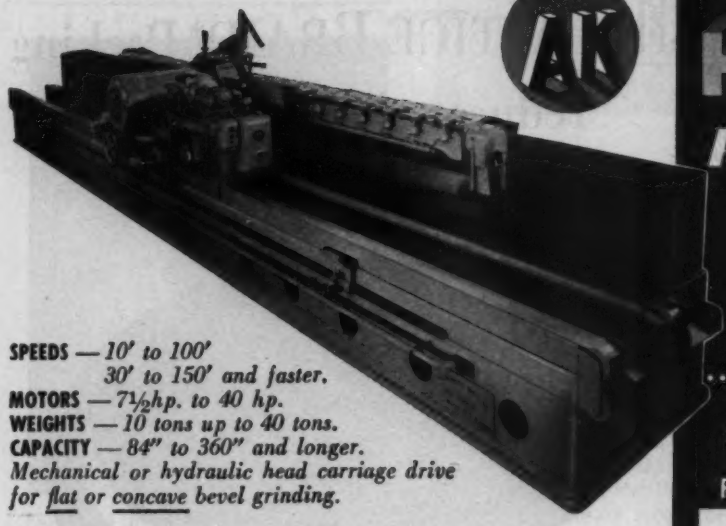

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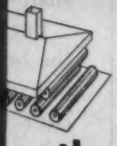

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SAFETY NEWS

Preliminary Program for NSC Pulp and Paper Section Announced

Keynoter for the forthcoming meeting of the Pulp and Paper Section at the National Safety Congress will be Arthur L. Ross, vice president of the Southern Kraft Div. of International Paper Co. at Mobile, Ala.

According to the preliminary program, Mr. Ross will speak at the opening session on Monday, October 18. The meetings of the section will be held October 18 through 21 at Chicago's Conrad Hilton Hotel. General chairman of the pulp and paper group is Arthur Carle, safety director for the Northwest Paper Co. in Cloquet, Minn.

Highlight of the first day's meeting will be the presentation of the Edward Benton Fritz Memorial Trophy, which is given annually to the mill having the most outstanding safety record for the previous year. In charge of the presentation will be A. Scott Dowd, publisher of THE PAPER INDUSTRY, donor of the award.

The second award to be given during the meeting will be the Arthur Hoyt Scott Trophy, a silver bowl donated by Scott Paper Co. of Chester, Pa. This will be the first annual presentation of the Scott prize, which will be granted yearly to that company whose operations in all its plants combined result in the best safety record during the contest period.

Meeting with Wood Products

Feature of the 1954 Pulp and Paper Section's meetings will be a joint session with the Wood Products Section on Thursday, October 21. Presiding will be Robert M. Gilmore, general safety supervisor for Rayonier Inc. at Hoquiam, Wash.

Following Mr. Gilmore's introductory remarks, Harry H. Jefferson will have charge of a demonstration of chain saw safety. Mr. Jefferson is safety and training officer for the American Pulpwood Association.

Also during the session there will be a showing of the film, "Safe Cutting and Piling," under the direction of Douglas B. Chant, secretary-engineer for the Ontario Pulp & Paper Makers' Safety Association. A panel discussion on the topic, "Prevention of Slipping and Falling Accidents" will close the joint meeting.

Five round table discussions will be staged during the four-day session, beginning with two on October 20: Sulfite Pulp Manufacturing and Sulfate Pulp Manufacturing. Presiding at the former will be Fred T. Morrish, safety supervisor for the Ontario-Minnesota Pulp & Paper Co. Ltd. at Fort Frances, Ont. In charge of the sulfate discussion will be D. V. Hill, safety director for the Mead Corp. at Kingsport, Tenn.

Say it isn't so

An added attraction will be a skit, "Say it Isn't So." Director of the play will be Dallas E. Henry, safety coordinator for Southern Advance Bag & Paper Co. Inc. at Hodge, La.

Participants will be staff members of Employers Mutuals of Wausau, Wausau, Wis.: Gordon Lemke, research engineer at Wausau; Bill Berfield, Escanaba, Mich.; Otto Holmskog, supervising construction engineer at Wausau; Robert Whiteside, safety engineer at Chicago, and George Williams, Green Bay.

The annual luncheon of the Pulp and Paper Section will be at 12:30 p.m. on October 21. Presiding will be Francis H. Wagner, safety director for the Mead Corp. at Chillicothe, Ohio.

Concluding the program on October 21 will be a symposium on Paper Manufacturing and three round tables: Paper Converting, Insulation and Roofing Products, and Folding Paper Boxes.

Presiding at the symposium will be C. R. Johnston, safety director for Cornell Paper Products Co. The participants and their respective topics will be: T. A. Moore of Liberty Mutual Insurance Co., "Guarding the Nip;" Julius Draper of Consolidated Paper Corp. Ltd., "Injury-Free Winder Operation," and A. E. Minor of Ontario-Minnesota Pulp & Paper Co. Ltd., "Preventing Slips and Falls." The speaker has not been announced for the fourth subject to be discussed, "Safety in Maintenance."

In charge of the three round tables will be: Paper Converting — Robert G. Belknap, personnel manager for Bemis Bros. Bag Co. at East Pepperell, Mass.; Insulation and Roofing Products — Amos S. Keen, safety director of Armstrong Cork Co. at Lancaster, Pa., and Folding Paper Boxes — A. O. Vranek, safety director of Container Corp. of America at Chicago.

Ontario Association Reports Increase in Frequency Rate During 1953

FAVORABLE RESULTS FROM increased effort was the goal set at the 39th annual meeting of the Ontario Pulp & Paper Makers' Safety Association.

Speaking at the gathering, which was held at the King Edward Hotel in Toronto, R. J. Askin of Abitibi Power & Paper Co. Ltd. found satisfaction in the fact that there were eight fewer fatal accidents in 1953 than in 1952. "But we should remember that there is often a very narrow margin between a 'near miss' and a fatality," he warned.

Discussing the 1953 experience, Mr. Askin declared, "the frequency of disabling injuries in the mills again rose somewhat over the previous year. For the past three years the frequency rates were as follows: in 1951, 15.6; in 1952, 16.1, and in 1953, 16.6. I agree that this upward trend is slight, but you will recognize that it is in the wrong direction and must be reversed. In woods operations, frequency was down slightly in 1953 as compared with 1952 (2.9 per cent) but is still above the 10-year average. Here the trend is downward, and we are all hopeful that the effort being made to do better will show further favorable results."

"It is said on good authority," Mr. Askin continued, "that 'less than 10 per cent of the industrial accidents result in injury to persons and less than 1 per cent produce injuries severe enough to cause the loss of one day or more from work'. Last year we re-

Safety News . . .

corded 2949 lost-time injuries to workers, which means that — on the basis of the formula above — there were at least 295,000 accidents causing material damage, wastage, or other losses. The elimination of these accidents is therefore a necessity and a challenge to all in the industry, no matter what measure of responsibility is carried — each and everyone in the industry has a part to play in the campaign of accident reduction."

Number of workers down

Although the number of reported injuries for 1953 was below that for the previous year, the frequency rate showed an increase of 3.1 per cent. This because the volume of employment in terms of time worked during 1953 fell below that for the preceding year by 1.6 per cent in mills and by 10.3 per cent in woods operations, with the combined total showing a drop of 4.6 per cent.

The reduction in fatal and disabling injuries from the 1952 figures amounted to a total of 319, or 9.7 per cent, while the over-all number of reported injuries showed a decrease of 7.9 per cent. Fatalities were eight less than in the previous year.

According to the annual report of Douglas B. Chant, secretary-engineer for the association, the frequency rate for disabling injuries (including six fatalities) in the mills in 1953 works out at 16.6 per 1,000,000 man-hours of exposure, up 3.1 per cent from 1952 but still the third lowest rate ever recorded.

Among 1953's 775 disabling injuries, 203 (26.2 per cent) resulted in less than six days lost-time, while 298 (38.5 per cent) necessitated layoffs of between six and 18 days. The severity rate for 1953 at 0.36 days lost per 1000 man-hours worked is unchanged from 1952, but is 23.4 per cent below the 10-year average.

Top 10 accident types

Among the various types of accidents, the following 10 produced more than one-half of the disabling injuries reported:

(1) Lifting, pulling, pushing—104 (13.4 per cent); (2) Slipping, stumbling, tripping—95 (12.3 per cent); (3) Falls of persons—61 (7.9 per cent); (4) Struck by falling objects—43 (5.5 per cent); (5) Handling shafts, planks, etc.—40 (5.2 per cent); (6) Bumping against objects—27 (3.5 per cent); (7) caught by winders or slitters—23 (3.0 per cent); (8) Scratches, small cuts—21 (2.7 per cent); (9) Handling rolls, bales, laps—15 (1.9 per cent), and (10) Handling pulpwood —7 (0.9 per cent).

Eight of these types appear in similar tabulations year after year, continuing to account for the lion's share of all injuries. "Machinery in motion" figured in 94 disabling injuries in 1953, as compared to 100 in 1952, including two fatalities each year. In proportion to the total, however, such injuries rank somewhat above the 10-year average. Lack of proper guarding was a factor in only a small number of these cases. Faulty work practices, thoughtlessness or lack of caution were the predominant causes.

Woods operations injuries

The injury experience in the woods operations of member firms during 1953 showed a frequency rate of 78.3 disabling injuries per 100,000 man-days worked, down by 3 per cent from 1952, but still 6.3 per cent above the 10-year average.

Injuries involving timber constituted a slightly larger part of the 1953 total than during 1952 or the 10-year average, while those produced by hand tools were down a little proportionately. Injuries due to loss of footing made up a larger part of the total than in the preceding 10 years, while frost-bites, drownings and burns by fire were fewer. The most noteworthy improvement was to be found in the number of fatal injuries, of which there were only four, as against 13 in 1952 and 109 during the 10 years ending with that year.

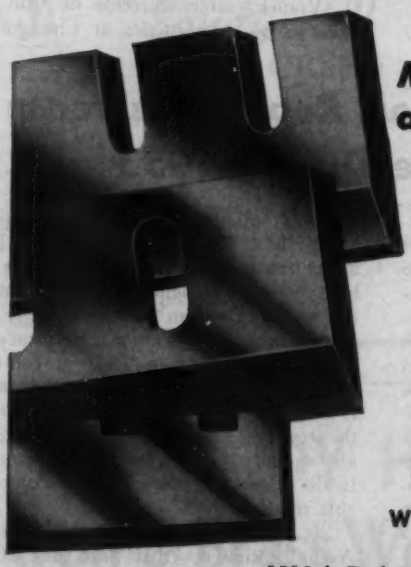
Again, limbing accounted for the largest single group of injuries, with piling close behind and loading dropping to third place in 1953, although ranking second for the 10-year period. Power saws figured in almost as many injuries in 1953 as during the entire 10 preceding years, a reflection of the rapidly growing application of these tools to pulpwood cutting. Skidding, rolling or decking logs produced considerably more injuries than the average, as was also the case in such operations as choking, yarding, and cable skidding.

Vigorous Campaign Gets Results at Sorg Paper

Sorg Paper Co. of Middletown, Ohio, is experiencing the best safety record in its history and is a leader among the major industries in the community.

The last lost-time accident at Sorg

HI-PRODUCTION Chipper Knives



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took place December 14, 1953. As of the middle of August, the 600 employees had worked 815,000 man-hours without a disabling injury.

In back of this achievement is a vigorous campaign carried out through the cooperation of management and employees alike.

Sixty-day limit

Late last year executives of the firm took a look at its safety record. Having averaged 8 to 15 accidents per year over the preceding five years, the feeling was that a 60-day period could not be exceeded without a disabling injury. The question was raised, "What can be done to prevent these accidents?"

D. G. Driscoll, Sorg president, directed a personal letter to each employee and his or her family calling their attention to the safety experience and soliciting their cooperation. This was followed by letters and "Safety-Grams" each month as reminders that each employee had a responsibility toward safety.

The safety department arranged meetings with the supervisors in the various departments and also made it a point to talk about safety with the individual employee. Safety equipment was inspected, and its use was urged.

At every opportunity unsafe practices and conditions were called to the attention of employees and management. Safety inspections were made and hazards observed by the men in the plant corrected.

This is a continuing campaign, Sorg officials emphasize. Currently, the company goal has been set at 1,000,000 man-hours without a lost-time accident.

Six-Month Report Issued by Southern Group

Seven member mills of the Southern Pulp & Paper Safety Association reported 0.00 frequency rates for the first half of 1954. The over-all rate for the 58 plants participating in the competition was 7.58, as compared to 8.52 for all of 1953 and 9.78 for 1952.

Among the bag plants there were two perfect records; box plants, one, and woods operations, two.

The perfect scores in the mill division were attained by Sonoco Products Co., Crossett Paper Mills, Buckeye Cotton Oil Co., National Container Corp. of Va., Certain-Teed Products Corp., Mead Corp., and Hammond Bag & Paper Co.

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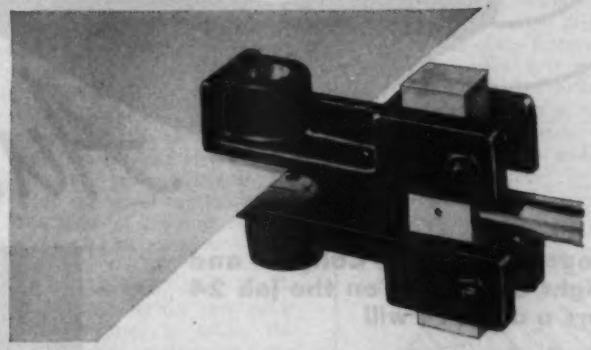

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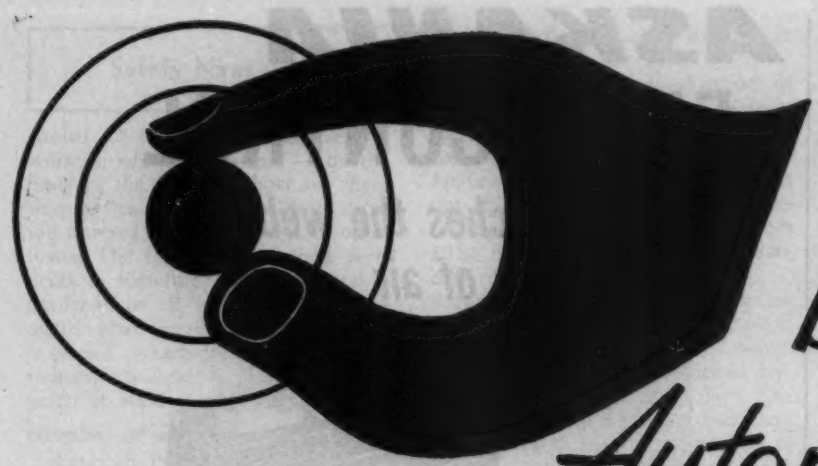

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PATENT REVIEWS

MELVIN NORD*

Stock inlet for papermaking machines

A stock inlet for papermaking machines is described by Gleb I. Goumeniouk in U.S. 2,677,991, issued May 11, 1954. The patent is assigned to Powell River Co. Ltd.

The apparatus is shown in Fig. 1. The headbox 10 is divided into a deceleration-rectification section 15, a still pond area 16 and an acceleration section 17. The section 15 is formed with a narrow slot-like entrance 20 at its lower end and diverges in cross section upwardly towards and communicates with the still pond chamber. The section 17 extends downward from the still pond and converges laterally and vertically towards its lower end, where it is connected to the slice 11.

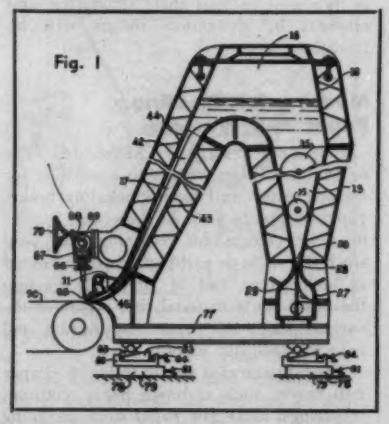


Fig. 1

Paper stock is delivered to the opposite ends of a distributor box 27. This box narrows down to a relatively long and thin slot 28, which communicates with the entrance 20 of the area 15 of the headbox. The stock moves in two streams slowly across the distributor box; the streams are brought together in the slot 28 which forms a constricted throat, giving the stock a predetermined velocity forward in the general direction of flow.

The stock entering the section 15 naturally slows down. One or more perforated rolls 35 extend across the section 15. These perforated rolls are used to distribute and rectify the flow of stock. These rolls are of a special design which helps to remove air from the stock.

The stock now moves into the pond chamber 16 where it is undisturbed.

The acceleration section 17 is relatively wide and thin and gradually converges towards its lower end. A number of spaced baffles or flow-eveners extend longitudinally in the section 17. The baffles or flow-eveners prevent cross currents in the acceleration section.

A hand wheel 70 is connected so as to regulate the thickness of the discharge slot at the bottom of the slice.

A level controller is used to maintain the stock in the pond chamber at a constant level. The pressure of the air in the pond chamber is controlled in accordance with the speed of the paper machine. The range of pressures for the range of a fourdrinier machine is 7-18 psia.

With this arrangement, there is always a proper supply of the pulp stock automatically controlled to satisfy the demand of the paper machine, and the machine operators do not need to worry about it. Furthermore, as the air in the pond chamber is normally below atmospheric pressure, this helps to remove excess air from the pulp stock. Air which is loosened from the stock by the rolls 35 rises through the section 15 into the pond chamber and is extracted there. Furthermore, any air which might tend to accumulate in the section 17 also rises into the pond chamber and is removed.

*Patent attorney, 17600 Pinehurst, Detroit.

Corrugated packing sheet

U. S. 2,668,786, issued Feb. 9, 1954 to Eugene L. Perry and assigned to Packaging Materials Corp., describes a corrugated packing sheet made of pulp which is flexible for folding both along lines parallel with and perpendicular to the corrugations. Such packing sheets are especially adapted to be folded around cylindrical articles such as glass jars, etc., and then folding the projecting ends of the sheet down over the ends of the jar to protect it in all directions from breakage.

Figs. 2 and 3 show a portion of the sheet, Fig. 4 shows an apparatus for preparing the sheets, and Fig. 5 shows in detail the scoring roll used in the apparatus.

The packing sheet is formed directly from pulp on a suction drum having its surface formed with corrugations. The cylinder is covered with an underlying coarse screen and a superimposed fine screen. The pulp is supplied to the cylinder 1 from a flow box indicated at 2. At the forward end of the flow box in the direction of rotation of the cylinder is a metering roll 3 for regulating the amount of pulp deposited on the cylinder.

The contour of the corrugations is such that the grooves in the cylinder in which the corrugations are formed are substantially filled with the pulp as the cylinder passes through the flow box, so that when the water is drawn from the pulp through the suction holes in the bottom of the grooves, the exposed face of the sheet will have depressions on the other side but of a very slight depth compared with the height of the corrugations.

The facing roller 4 is mounted in a flow box from which it picks up a layer of pulp through the suction supplied from a suction port 6. This roller is of smooth contour and is covered with coarse and fine screens.

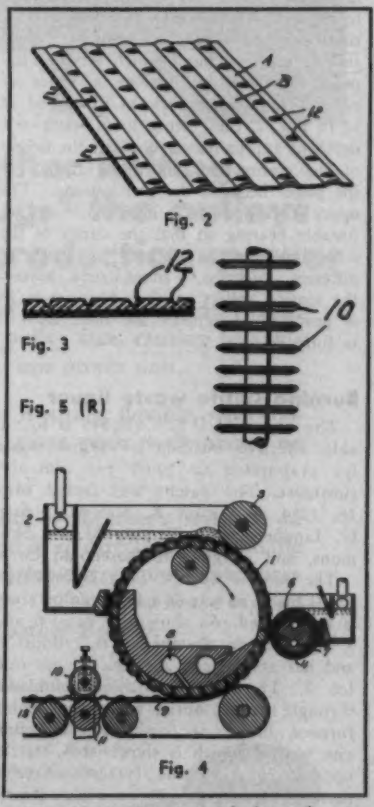


Fig. 2

Fig. 3

Fig. 5 (R)

Fig. 4

The layer of pulp picked up by the facing roller is transferred to the surface of the sheet formed on the cylinder at a time when both sheets are quite wet. The suction through the surface of the cylinder draws the soft sheet of wet pulp on the facing roller down against the sheet of pulp so that the sheet formed on the facing roller assumes the contour of the exposed face of the corrugated sheet, and the contacting fibers are so intermeshed by the suction that there is no significant line of demarcation between the pulp applied by the facing roller and the pulp sheet formed on the cylinder. The transfer of the pulp from the facing roller is aided by a discharge of compressed air from the compressed air pipe 7.

The composite sheet has the cross sectional contour shown in Fig. 2, in which A indicates the corrugations and B the spaces between the corrugations. In the spaces B there is no discernible line of demarcation between the layer of pulp picked up on the cylinder and the layer transferred from the facing roller. The same is true of the corrugations A except that the fibers at both surfaces of the corrugations are somewhat more compressed than in the intermediate part, and the whole surface on both sides carries the impression of the fine screen forming the surface of both the cylinder and the finishing roller.

The composite sheet is discharged from the cylinder by compressed air from a compressed air pipe 8 onto a drying belt 9 below the cylinder. At a point somewhat beyond the point at which the sheet is received by the drying belt, where the pulp is partially dried but is still soft enough to receive impressions, the belt is discontinued and a pair of scoring rolls 10 and 11 are introduced which serve to impress into the corrugations a series of parallel score lines such as illustrated at 12 in Fig. 2, these score lines being of a depth of approximately one-half the height of the corrugations above the surface of the paper between the corrugations. The upper scoring roller is mounted in an adjustable bearing so that the depth of the score lines may be adjusted for sheets of different thickness. Immediately beyond the scoring rollers another drying belt 13 is provided to support the sheet until it is fully dried.

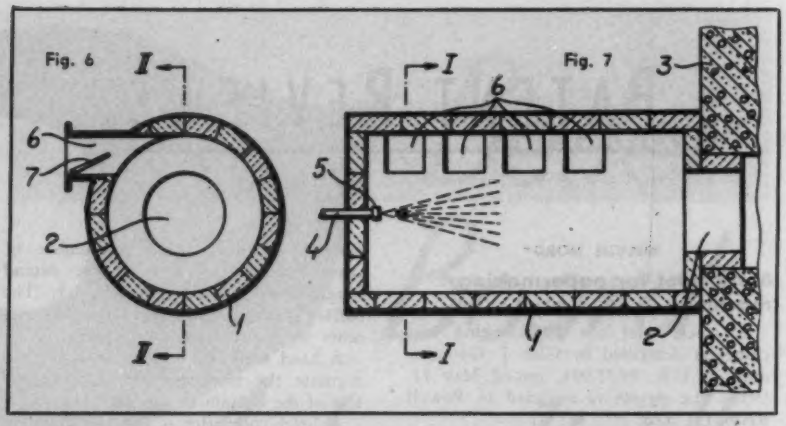
Burning sulfite waste liquor

The object of U.S. 2,678,613 is to enable effective burning of sulfite waste lye evaporated to 50-60 per cent dry substance. The patent was issued May 18, 1954, to Gustav K. Soderland, Sten G. Lindberg, and Torsten M. G. Simmons, and assigned to Rosenblad Corp.

The fuel is burned in a cyclone-type pre-furnace, in which a high temperature is maintained. As shown in Figs. 6 and 7, the cyclone chamber 1 is cylindrical and has at one end a restricted gas outlet 2. The chamber 1 communicates through the gas outlet with any suitable furnace, boiler or combustion chamber, one wall of which is shown at 3. At the opposite end of the cyclone chamber there is arranged one or more central supply pipes 4 for liquid, each pipe having an atomizer or spray nozzle 5 through which the liquid is sprayed into the chamber 1.

The major portion of or the whole amount of the combustion air is introduced through a number of air inlets 6, extending tangentially to the inner wall of the cylindrical chamber 1 and being distributed along the length of the cyclone chamber. The inlets may be controlled individually or in common by means of throttles 7.

In operation, the liquid, evaporated sulfite waste lye, is introduced through the nozzle 5 and intimately mixed with the air supplied through the inlets 6 so as to form a whirl passing through the



chamber in a helical path. The fuel particles are introduced gradually into the whirl, the apparatus acting like a cyclone so that each fuel particle will be suspended in the whirl of gases for a sufficiently long time to get completely dried, or dried and ignited, before it will be centrifuged against the cylindrical wall of chamber 1, so that the particles are completely burned in the chamber. Due to the cyclone effect the non-burned, dried particles will be flung towards the cylindrical wall of the chamber 1 and caused to move along said wall together with the whirl. Such particles will be ground and their velocity reduced due to the friction against the wall, so that the air will get sufficient time to burn the particles before they leave the chamber 1. Thus, when the combustion products leave the chamber 1 and enter the furnace 3 there will be no sticky particles which may deposit on the cooled surfaces of the furnace.

Burning of sulfite waste lye is also intimately bound up with the problem of handling the ashes obtained. A lye droplet which burns in suspended condition gives a thin-walled hollow ash particle of the approximate shape of the shell of a blown egg and of the same order of magnitude as that of the droplet. Obviously ashes in this form, amounting to a quantity of about 10 per cent of the dry-substance of the lye, will be unreasonably bulky. On account of its extremely low weight by volume the major part of the ashes will accompany the combustion gases through the furnace or boiler 3 causing a deposit on the tubes, and will finally be discharged through the chimney, to the detriment of the surroundings, if the ashes cannot be separated before their exit.

In accordance with this invention, on the other hand, the ash particles will be subjected to a continuous crushing and/or grinding action against the cylindrical wall-surface of the cyclone chamber 1, so that they will lose their hollow character, and their weight by volume is increased so that their separation and removal by dynamical means will be facilitated.

Machine for Treating Paper Mill Waste

U.S. 2,672,075, issued March 16, 1954 to Douglas Fraser, relates to a machine for treating paper mill waste, including broke-paper or esparto grass or straw, and has for its object means for returning into pulp stock the made or partly-made paper known as broke-paper, and of effectively treating the other waste material that occurs in the various stages of paper manufacture and reducing this also to pulp stock.

The apparatus is shown in Fig. 8. Paper mill waste, such as broke paper, cuttings, trimmings, loose raw paper stock including straw, esparto or other grass, is introduced to the vessel D through the cover opening 6 and water is sprayed in. The raw material is engaged by the drag arms 12 which in their rotary motion and inclination induce the entry of material which is stripped

Other Patents of Interest To The Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Vacuum slice	Franklin J. Reilly	2,690,099	9/28/54
Stock distributor for papermaking machines	Beloit Iron Works	2,677,992	5/11/54
Method for automatically picking waste material from carton blanks	Mishle Printing Press & Mfg. Co.	2,677,994	"
Collapsible carton	Sutherland Paper Co.	2,678,152-3	"
Bag closure	General Mills Inc.	2,678,154	"
Dyeing hardboard	Masonite Corp.	2,678,588	5/18/54
Device for setting up collapsible cardboard cartons	Bloomer Bros. Co.	2,678,590	"
Handle structure for carriers	The Gardner Board & Carton Co.	2,678,751	"
Paperboard shipping container	Anderson Box Co.	2,678,765	"
Box or carton	David Levkoff	2,678,766	"
Paperboard blank	Marathon Corp.	2,678,770	"
Box scoring device	Earnest C. Whitten	2,679,104	5/25/54
Refiner for fiber suspensions and pulp	Karl A. Stardal	2,679,788	6/1/54

Patent Reviews . . .

away and teased by engagement of the arms 12 with the tearer brackets 14. The broke material torn off the uppermost arm 12 drops to the arm or arms of the next tier. Centrifugal force tends to keep the broke paper away from the central shaft and with wet paper its path along the arms 12 is lubricated so that the bulk of the broke material entering is engaged by and macerated upon the tearers 14. When the half-formed paper pulp reaches section 3 of vessel D it falls on the partition 4, where the raw pulp is dragged around over the sharp edges of the grooved plate 4a by the impellers 16. The paraboloid type of section of these impeller blades tends to cause

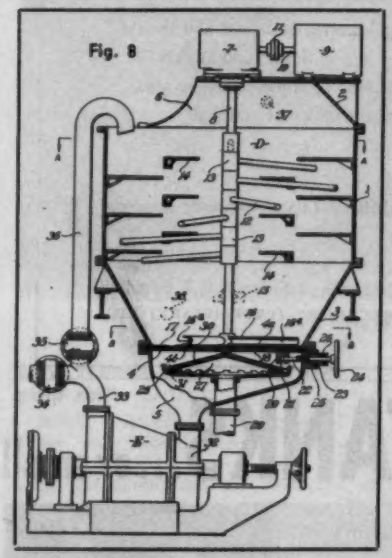


Fig. 8

the pulp to engage and re-engage the surface of the plate 4a, and when the predetermined fiber size has been attained the particles pass through the perforations and fall on the grit catcher below, the pulp traversing the mesh fabric under water flow down the incline into the depression 31, where any remaining grit separates and passes to the launder below and is removed from the vessel through pipe 29. In the passage of the pulp over the mesh fabric any grit or sand present passes through the openings in wire mesh down the surface grooves cut in the face of the support and are washed into the launder and pass to waste. When the pulp passes the grit meshing 30 it overflows the launder and passes to the refiner E. If the vessel D is not keeping pace with input or the broke paper is hard and caked, the apertures in the partition are widened to make the openings in the plates 4a and 4b more coincident by manipulating the handwheel 24, this arrangement being of the push-pull type whereby aperture size can be adjusted with a single control. With this arrangement the coarse pulp is fed to the refiner D and is recirculated in the treatment vessel until the desired texture of pulp is obtained.

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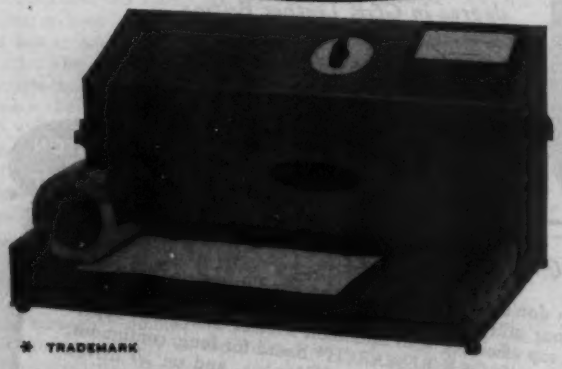

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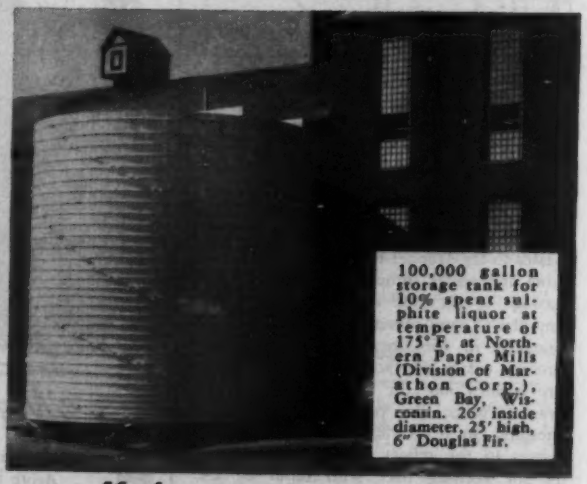

100,000 gallon storage tank for 10% spent sulphite liquor at temperature of 175° F. at Northern Paper Mills (Division of Marathon Corp.), Green Bay, Wisconsin. 26' inside diameter, 25' high, 6" Douglas Fir.

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FOREIGN ABSTRACTS

Bigny bleached straw pulp mill

New French bleached straw pulp mill

A very brief description is given of the Bigny mill, recently opened in France, which produces 200 tons of bleached straw pulp per month, and the production of which should now be over 500 tons. The carefully cleaned straw is first impregnated with black liquor and then treated with white liquor and cooked at 100° C.

Caustic soda, chlorine, and hypochlorite are all made electrolytically at the mill. The pulp is broken up and passed through a sand trap to a rotating sorter, the rejects from which are remilled and then re-screened. Any further rejects are recooked. The pulp, passed through another sand trap, is then bleached.

At the opening of the plant, various notables gave speeches which are also abstracted.

In the July issue of the *Papeterie*, the magazine stock had in its furnish 60 per cent of bleached straw pulp made at the Bigny mill.

The article is illustrated. Anon. *Papeterie*, 76, No. 7, 427, 429, 431, 433-4 (1954) (in French).

Indian raw materials for writing and printing papers

These are two papers in an extensive series from the laboratories of the Forest Research Institute at Dehra Dun, India, on the possible use of indigenous raw materials in the production of pulp, paper, and board.

In the first study, the wood used is *Albizzia stipulata*, Boivin, a large deciduous tree growing in the sub-Himalayan area in southern India, Ceylon and Burma. In round numbers, the wood contains 60.2 per cent Cross and Bevan cellulose, 23.7 per cent lignin, and 18.3 per cent pentosans. Laboratory kraft cooks give good yields of bleachable pulps, the average fiber lengths of which are 1.02 mm. The pulps give rise to well-formed writing and printing papers with satisfactory strength properties, when made on the Institute experimental paper machine, even when 100 per cent *Albizzia* furnish is used. However, in commercial practice, the authors believe that it would be advisable to use about 30 per cent bamboo pulp in the furnish. In this article, the authors include two sample sheets made from 100 per cent *Albizzia* pulp.

In a second paper, bleached sulfate pulps are prepared on a laboratory scale from two species of wattlewood, *Acacia decurrens* and *A. mollissima;* these are now being raised on a large scale on plantations in Madras for the recovery of their valuable bark tannin, and the wood should be available in quantity as a by-product. Proximate analyses of *Acacia decurrens* and *A. mollissima* respectively, give 63.2 and 63.95 per cent Cross and Bevan cellulose, 21.2 and 21.2 per cent lignin, and 19.35 and 20.3 per cent pentosans. These pulps are very short fibered, the average length for *Acacia decurrens* being 0.86 mm. and, for *A. mollissima*, 0.7 mm. Hence, in making up sheets of writing and printing papers, it is necessary to add at least 30 per cent bamboo long-fibered pulp, together with *Acacia decurrens*, and 30-40 per cent bamboo long-fibered pulp, together with *A. mollissima*. Actual samples of these papers are included in the original article. R. V. Bhat and S. R. D. Guha. *Indian Forester*, 79, No. 9, 475-83 (1953); R. V. Bhat and K. C. Virmani. *Indian Forester*, 79, No. 10, 526-38 (1953), and *Indian Pulp and Paper*, 8, No. 11, 505-13 (1954).

Filter papers made from novel raw materials

After reviewing the more common fibrous materials used in filter paper manufacture, the author takes up bonded filter webs and plastics referring specifically to "Selecta Rhovyl" (a polyvinyl chloride fiber), outlining its properties, limitations, and possible uses. The prognosis of the author is that new materials will *not* replace filter papers and glass fritted filters but will supplement their uses, particularly when the solutions to be filtered have high acidity or alkalinity to which ordinary filter papers are especially sensitive. Five tables and six references are given. Auguste Grune. *Chem.-Ing. Tech.*, 26, No. 4, 221-4 (1954) (original in German) (through *Bull. Inst. Paper Chem.*, 24, 779 (1954).

Sorption of vapors, swelling and inhibition of cellulose

In the experiments described by the authors, bleached spruce sulfite pulp is used. Details are given for making the determinations as well as a drawing of the equipment and the technique for controlling the relative vapor pressure (R.V.P.).

The absorption of water vapor is determined at 11-98 per cent relative humidity (R.H.); that of methanol is measured at 49-99 per cent R.V.P. and that of carbon tetrachloride is determined, in a few orienting experiments, at the higher R.V.P.'s. With water vapor up to about 70 per cent R.H., the method that is used in drying the pulp is of no importance. Irrespective of whether the pulp is dried at 105° or *in vacuo* at 50°, no differences are noted at any R.V.P. in the case of methanol. The rate of vapor sorption is a definite function of the amount of liquid still to be sorbed so as to reach the saturation equilibrium of the sheet. A very similar relationship also holds in the case of swelling. The liquids used in the sorption studies are water, formaldehyde, methanol, ethanol, propanol, amyl alcohol, acetone, nitrobenzene, toluene, and hydrazine. With the exception of nitrobenzene, the percentage of swelling checks well with the data obtained by Kress and Bialkowsky (*Paper Trade Journal*, 93, No. 20, 35-44 [1931]).

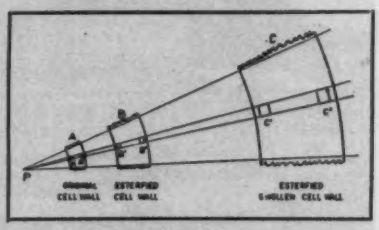
Making the assumption that the interaction between the cellulose and the liquids is governed by a reaction between hydrogen bonds of the cellulose and the molecules of the liquid, three liquid types are differentiated: (a) those which show practically no interaction (*e.g.*, carbon tetrachloride, toluene, nitrobenzene, and amyl alcohol); (b) those which do not enter the crystal lattice but which react with the weaker hydrogen bonds in the amorphous regions of the cellulose (*e.g.*, water and alcohols of low molecular weight), and (c) those which penetrate the crystal lattice and form new compounds (*e.g.*, hydrazine).

The authors data help to interpret rate reactions and to explain the behavior of cellulose on drying. Seven tables, 19 figures, and 15 references are given. K. Schwabe and B. Phillip. *Holzforschung*, 8, No. 1, 1-12 (1954) (in German).

Distribution of components in cell walls of wood and cotton

These two papers from the Swedish Forest Products Research Laboratories form a part of a very extensive study.

In the first paper (which is actually the sixth of this series), the influence of swelling of esterified fibers is studied by making photomicrographic measurements of the perimeters of the fibers and lumina. The article also shows how equivalent distances compare in cross section of the fiber, prior to and following esterification of the fibers with p-phenylazobenzoyl chloride. Within an error of about 10 per cent, the relative concentration of the cell wall components across the cell wall of an esterified swollen fiber is the same as that of an untreated fiber. This is shown schematically in the figure. Here A shows an idealized cross section of the original fiber; B shows that of the fiber esterified with P-phenylazobenzoyl, and C shows an esterified *swollen* fiber. The ratio between the surfaces C′ and C″ is shown to be the same as that between B′ and B″ and that between A′ and A″.



In the second paper, the distribution of cellulose and the hemicelluloses in the cell walls of spruce, birch, and cotton are studied by microspectrographic techniques after esterification with P-phenylazobenzoyl. In this extensive investigation it is shown that holocellulose is quite evenly distributed across the cell walls of spruce and birch. The cellulose appears to be most densely packed around the lumen. Hemicelluloses form about one-half (or more) of the carbohydrate material in the outer regions of the cell walls of spruce and birch. Near the lumen the estimated hemicellulose percentage is 10-20 per cent. In cotton the cellulose is quite regularly distributed across the cell wall, with a small amount of "accessible material" found largely in the outer regions of the fiber.

The authors discuss the techniques used in preparing the fibrous materials, analyses of the components, and details of the measurements used.

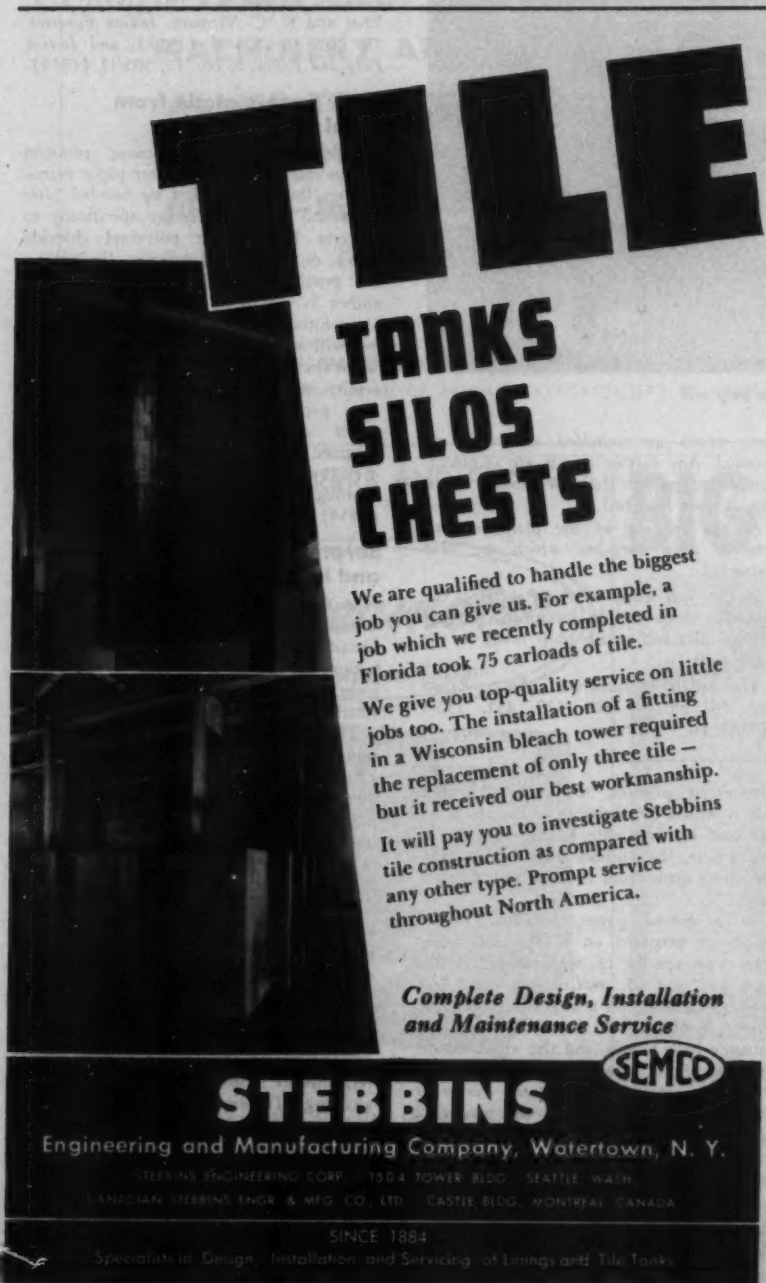
Experimental results are shown in a series of 10 transmission curves, 18 relative distribution curves and in a series of graphs indicating "absolute" distribution. Twelve references in the second paper. S. Asunmaa and Paul W. Lange. *Svensk Papperstidn.*, 57, 498-500; 501-516 (1954) (in English).

Hardwood pulps made by mild caustic treatments

Chips made from birch, hornbeam, basswood, aspen, beech, and oakwood are treated for four hours at 15-20° C. with caustic soda, using 1 part of NaOH to 10 parts of wood and a wood to liquor ratio of 1 to 4. This treatment is then followed by grinding in a Lamort disintegrator provided with a grid. Beating is carried out in a Lampén mill. Neither beech nor oak are actually pulped by this process.

In the case of the other woods, hydration to 53-70° Schopper Riegler is achieved. Better results are obtained if the initial alkaline digestions are carried out at 60-90° C. Pulps prepared in this way show a somewhat improved tear resistance.

The best pulps are made from birch and hornbeam, when temperatures above 60° are used. In no case, is air excluded in the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initial alkaline extraction. The pulps, up to 10-25 per cent, might be used in connection with other furnishes in the manufacture of paperboard. J. Vilars. *Chimie & Industrie*, 72, No. 1, 67-8 (1954) (in French).

Sawmill waste as a raw material for sulfite pulp

A study shows that it is possible to produce satisfactory bleached sulfite pulp from pine sawmill waste. *A priori* it seems that the resin content of the pines may give pitch troubles in the utilization of the pulp. However, in a three-stage bleaching operation, troublesome resins are removed to such an extent that no pitch difficulties ensue. There are also indications that unbleached pulp can be prepared from the same raw material and still give no pitch trouble.

At 39° Schopper-Riegler, the bleached pine sulfite pulp, when tested by the Standard Swedish procedures (CCA 17), shows the following properties: breaking length, 10,400 m.; burst factor, 80; tear factor, 88, and 6,300 double folds. No references are given. Erik Hagglund and Lennart Stockman, *Svensk Paperstidn.*, 57, 409-10 (1954) (in Swedish, with English and German summaries).

"Moldability" of coated and uncoated boards

Chromo-imitation boards, both coated and uncoated, are tested for "moldability". This property depends on the basis weight, the composition, and especially on the moisture content of the board. When the water is less than 6.7 per cent, the board can not be molded without cracking; and in general, the higher the moisture content (in measurements made up to 11.6 per cent), the lower the temperature at which the board can be molded successfully.

On the other hand, the lower the percentage of moisture, the higher the temperature that can be reached without blistering. Especially in coated boards, the temperature of suitable molding is quite close to the blistering temperature. Suitably coated boards can be molded at a considerably lower temperature than can an uncoated board having the same moisture content. Otto Horth. *Wochbl. Papierfabrik.*, 82, 311-4 (1954) (in German).

Expansion in a Finnish sulfite pulp mill

At Jakobstads Cellulosa Ab, in Finland, the capacity of the sulfite mill has been raised to 70,000 tons per annum. Main items of the enlargement are the following: two new 300 cu. m. digesters with blow tanks; two new acid towers, and one pressure acid cistern; new knotters and flat screens; 2 new barking drums; a 10-knife chipper and a new chip screen, from which chips are sent via a new belt conveyer to the digesters. Other innovations are listed. Anon. *Finnish Paper and Timber*, 5, No. 5, 63 (1954) (in English).

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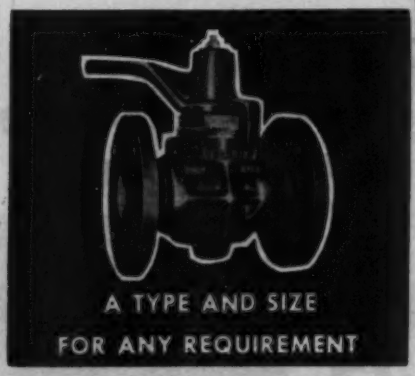

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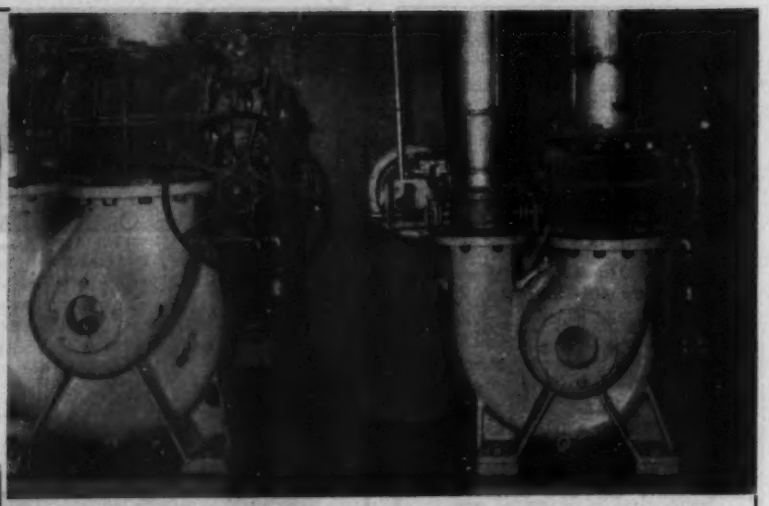

DeZurik Worm-Gear Valves on the white-water pumping system of the new Weyerhaeuser kraft mill at Everett, Washington.

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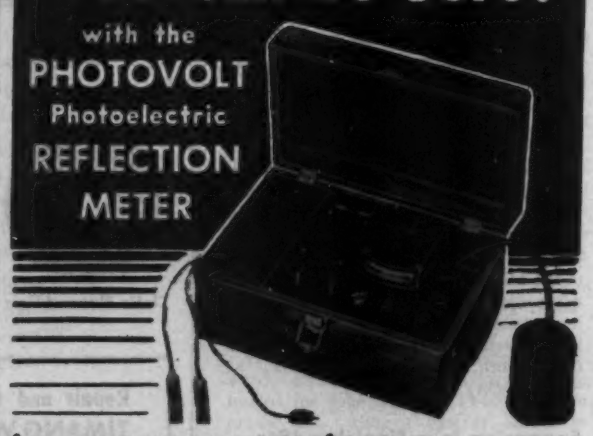

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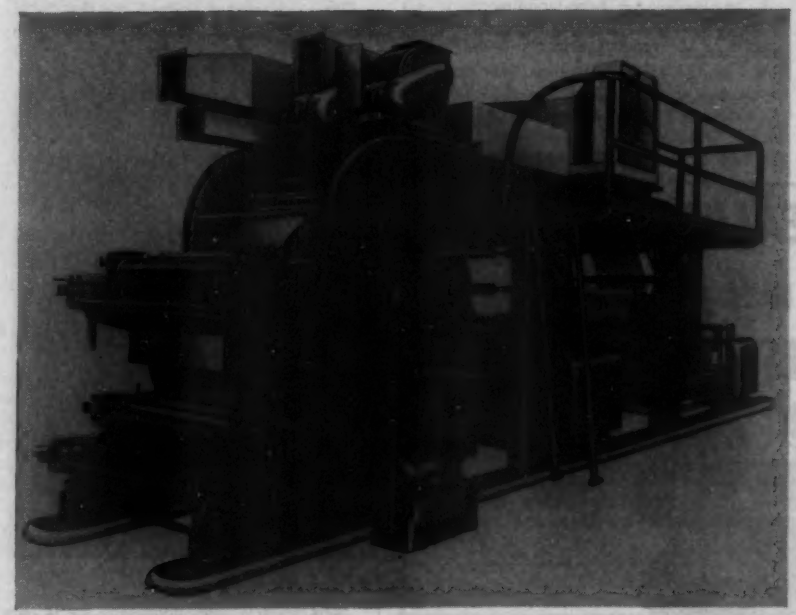

Flexographic press

The Model A-4 Flexographic press combines high speed with accurate hairline register color printing on all types of flexible stretchy papers and materials such as polyethylene, vinyls, plastic films and cellophane.

Construction embodies a single 60-in. diameter impression cylinder around which is mounted one to four color stations. In operation the web locks around the cylinder, making it practically impossible to print out of register, according to the manufacturer. Newly designed splashproof fountains, hydraulic throw-outs and continuous operating ink units are some of the many features constructed into this machine. It is offered in any width from 20 to 50 in., with print repeats from 12 to 36 in.

Special equipment is available for this A-4 press. The press is also available with six color stations mounted around a single 83 in. diameter impression cylinder. A similar press called the A-5 is identical in operation, but is smaller in size, having four color stations around a 36 in. diameter cylinder. *Hudson-Sharp Machine Co., Green Bay, Wis.*

Pneumatic tire fork lift trucks

The development of two new models of pneumatic tire fork lift trucks has been announced. They are the FTP40-24 (gasoline) and FTPD40-24 (diesel).

Rated at 4,000 lb. capacity at a 24 in. load center, these new fork lift trucks offer functional, modern style and many features that, according to the manufacturer, assure fast handling, operating economy and low maintenance. Included are the following: full, front-vision instrument panel; automotive-type single lever gear shift mounted on steering column; finger-tip, flip-over parking brake; quick-change heavy-duty clutch; full-floating, self-energizing brakes, and center point steering.

Model FTP40-24 is powered with a 4-cylinder, 49 hp gasoline engine, Model 4B-153. Model FTPD40-24 is powered with a 4-cylinder, 40.5 hp diesel engine, Model 4BD-153. Engine parts are 85 per cent changeable. Both models are available in five standard mast heights with lifts of 72, 84, 108, 114, and 120 in., and with a torque converter at an additional cost. *Buda Co., Div. of Allis-Chalmers Mfg. Co., Harvey, Ill.*

Polarizing microscopes

A new series of polarizing microscopes for use in the pulp and paper industry and related fields has been announced. These microscopes feature a ball-bearing, low-position, fine-focusing stand previously available only with the line of Dynoptic laboratory instruments. A ball-bearing, revolving stage with one-degree graduations and vernier reading to six minutes of arc is another feature of these microscopes.

A ball-bearing double nosepiece, with ball stop and true return to centration when changing objectives, is employed. Standard equipment is 10X and 45X strain-free achromatic objectives. Substage is of the variable focus type. For protection against dust, optical elements of the flip-in Polaroid analyzer are fully enclosed in the body tube.

A bertrand lens, for isolation of small crystal interference figures, is employed. Eyepieces are 7.5X and 10X Huygenian, with crosshairs and focusing eye lenses. Coarse adjustment is provided by a rack-and-pinion, while the fine adjustment is the ball-bearing and roller design found in the firm's laboratory instruments. The instruments can be furnished with an integral substage illuminator instead of the regular plano-concave mirror. *Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.*

Push-type cranes

A new, expanded line of push-type cranes with new, improved construction features has been announced. A light-duty model is available in five different capacities, and heavy-duty models are available in seven capacities.

The heavy-duty models feature smooth performance and ease of operation because of precision manufactured end trucks, according to the manufacturer. The underhung heavy-duty cranes are equipped with forged steel wheels with removable head axles. All heavy-duty push-type cranes are available in various spans and can be equipped with hand-operated or electric hoists. *Industrial Crane & Hoist Corp., 315 N. Ada St., Chicago 7, Ill.*

Abrasion-resistant iron alloy

A new, extremely hard, abrasion-resistant iron alloy, "Tisco 150-Y," can be heat treated to 700 Brinell, according to the manufacturer.

One of the typical applications of this alloy is in production equipment in plants processing roofing material, wallboard, and carton stock from crude scrap containing tramp iron, sand and other abrasive matter. In this application it is claimed that "Tisco 150-Y" has indicated a life expectancy two to six times as great as other alloys used for the same purpose.

Many other applications are suggested for the new alloy, including feed and chute liners, liners for abrasive mixing equipment, pump casings, pump liners, pump impellers, conveyor flights, and mixer impellers. *Taylor-Wharton Iron & Steel Co., High Bridge, N. J.*

Paper smoothness tester

The RD smoothness tester, for determining smoothness of both the felt and wire side of paper, separately and simultaneously, is for use in laboratory tests by skilled personnel.

The test consists of comparing the paper sample against optically flat metal surfaces,

by determining the rate at which air flows between the two. The sample is placed between two circular steel blocks and held by the top one only. It is tested in a practically uncompressed condition.

This instrument is available in two models. One model, having small test blocks with contact area of 1 sq. in., is used for newsprint, kraft, bond, and other low-finish papers. The other model, with large test blocks, is used for smoother papers. These blocks also have a contact area of 1 sq. in.; however, surfaces are made so that air is introduced through an annular slit and has a shorter distance to leak over the paper, providing a test requiring only one-seventh the time of the small blocks. *W. & L. E. Gurley, Industrial Div., Troy, N. Y.*

Leakproof tube fittings

A new line of leakproof tube fittings that withstand severe vibration and major tube movement has been announced.

Being of two-piece construction, the manufacturer states that Dekoron Hi-Duty tube fittings effect substantial savings in installation time. The fitting is delivered assembled with nut in body. The tube is merely inserted into the fitting body and the nut tightened. This shears the sleeve from the end of the nut and the sleeve than attaches itself tightly to the tube for a pressure-tight and leakproof joint. There is no loose sleeve, no flaring or special preparation of tubing, according to the manufacturer.

Other advantages claimed are that these fittings withstand over five times as much vibration as compression or flared tube fittings, they can be disconnected and reconnected many times without leakage, and they have long dry-seal type pipe threads. Most sizes are furnished in brass, aluminum, steel, and 316 stainless. *Dekoron Products Div., Samuel Moore & Co., Mantua, Ohio.*

New Products . . . . . .

Proportioning pump

New models and improvements in the design of the Model 1105-S proportioning pump have been announced. This model is now offered as either a 10-gal.-an-hour or 20-gal.-an-hour pump, with open or explosion-proof motors, in a variety of voltages. The pumps can also be furnished with either standard steel and stainless trim measuring cylinder assemblies or with measuring cylinder assemblies of 316 stainless steel and with ceramic plungers.

Among the new features of these pumps are a self-aligning connecting rod and a one-piece barstock cylinder. This pump is available in four sizes in various materials of construction. *Proportioneers, Inc., Providence, R. I.*

Steam traced piping

"Unitrace," an integrally extruded steam traced aluminum pipe, is the result of joint engineering efforts by Alcoa and Hercules Powder Co. to find a new solution to the problem of applying heat to product piping. In contrast to normal methods of heating lines by using an external steam jacket or steam tube to apply the necessary heat, Unitrace is so produced that the steam line is an integral part of the pipe.

Extruded as a single unit from Alcoa 3S-F aluminum alloy, the new product is slightly oval in cross section because of the crescent-shaped steam passage adjacent to the product line. The size now available has the pipe dimensions of 2 in., Schedule 40 pipe.

Pre-formed insulation will fit Unitrace. In the case of the 2 in. pipe, the new product is designed so that insulation for

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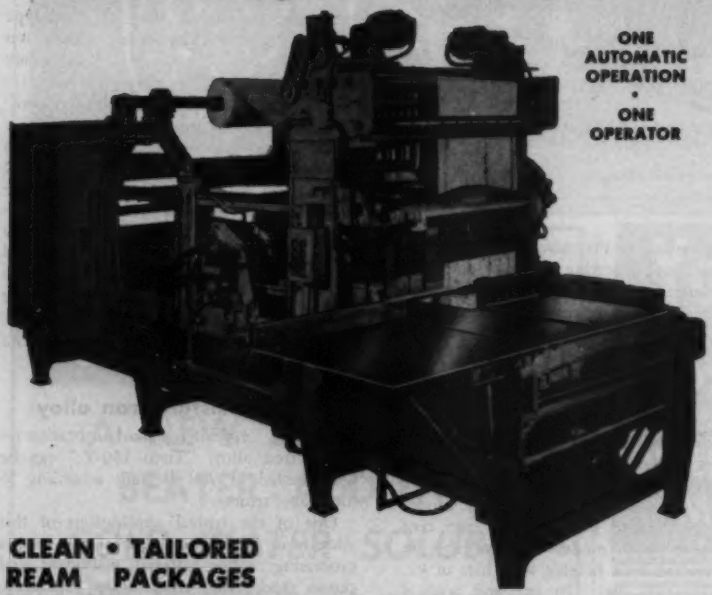

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2½ in. standard pipe will form naturally. When insulation is used, a smaller size can be used than with the older steam-jacketed piping. Because of improved efficiency, thermal insulation will be unnecessary in many cases, particularly where set quantities of process steam are allocated for tracing purposes, according to the manufacturer. *Aluminum Co. of America, 720 Alcoa Bldg., Pittsburgh 19, Pa.*

Axial flow agitator

A new axial flow agitator for use with new or existing stock chests has been announced. It has an anti-friction pillow block bearing at both drive and impeller ends that reduces maintenance. The impeller and bearing is an anti-friction ball bearing, which is prepacked, grease lubricated, and housed in a cast iron casting filled with water-repellent grease. It is claimed that the agitator does not require fresh water supply for lubrication, as in the designs that use laminated plastic bearings. There is no dilution of stock. Bearing replacements are not necessary, and impeller and bearing require repacking no more than twice yearly, according to the manufacturer.

Its streamlined impeller and impeller blades are said to provide greater efficiency with less power. Simple, quick speed changes provide flexibility and agitation capacity, change in capacity being made without change in impeller size through change in speed. This means varied capacities with one size impeller. Parts are interchangeable.

Designed for quick, easy removal from the stock chest, the shaft and impeller assembly can be removed without dismantling the impeller from the shaft by removing the outer wall cover plate and anti-friction shaft bearing in the chest. The impeller can be removed from the shaft while the assembly is within the chest. *D. J. Murray Manufacturing Co., Wausau, Wis.*

Cleaner for washer screens

A new method of cleaning cooked rag washer screen sections in place in the washer, with virtually complete elimination of hand work, has been announced. This method is also said to eliminate any use of hazardous acids.

The compound used is designated as 81XX. It is a non-toxic, non-volatile phosphoric acid base cleaner which does not require special neutralizing after its use, according to the manufacturer. It contains, in addition to the inhibited acid, a synthetic detergent with strong wetting action. It is said to be completely harmless to all metals.

Screen sections immersed in a 10 per cent by volume water solution of the 81XX concentrate for ½ hour at a temperature of 160° F. are completely clean after a pressure water rinse, according to the manufacturer. It is claimed that six to eight hours per screen can be saved by this method, since they can be cleaned without removal of the sections. *Magnus Chemical Co., Inc., South Ave., Garwood, N. J.*

Fractional-horsepower gear-motors

A new line of fractional-horsepower gear-motors, smaller and lighter than previous designs, has been announced.

The new right-angle and concentric-shaft gear-motors are said to be 10 per cent lighter than previous models. Because the driving motor is close-coupled and positively geared to the output shaft, the units offer maximum transmission of torque, uniform speed, and no slippage, according to G-E engineers.

The motors are reconnectable externally to reverse the direction of shaft rotation. Large bearings, with extra high capacity, are locked to carry motor shaft thrust in either direction.

The concentric-shaft motor is available in ratings of ¼, 1/3, ½, and ¾ hp, from 13.5 to 520 rpm, 115/230v single-phase and 220/440 v three-phase. The right-angle shaft gear-motor is available in ratings of ¼, 1/3, ½, and ¾ hp, from 24 to 148 rpm, 115/230v single-phase and 220/440v three-phase. *General Electric Co., General Purpose Component Motor Dept., Schenectady 5, N. Y.*

Impervious graphite centrifugal pumps

A new series of "Karbate" impervious graphite centrifugal pump sizes and types has been announced. The new Type C and Type F pumps, through an array of design improvements on the original Model A pump, offer two distinct new pumps for application not only for severe corrosive conditions, but also wherever pumping conditions are corrosive to ordinary iron and steel. According to the manufacturer, they are easier to install, operate, and maintain, and they cover a greatly extended range of capacities.

The "Karbate" Type C centrifugal pump, a heavy-duty model, is said to have an

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HERE'S A CASE IN POINT. The installation shown here consists of two complete Lewellen automatic caliper controls, rebuilt last year to include all improvements Lewellen has developed since 1927. *Today, uniform caliper is maintained within .00025"!* Exact thickness is measured, and continuous automatic adjustments are made at the stock gate to compensate for any variation. The quality of materials and workmanship that go into Lewellen automatic controls practically eliminates adjustment and maintenance.

This control has been in continuous operation for 26 years. In 1953 it was completely rebuilt, and every improvement developed since its initial installation was incorporated into it.

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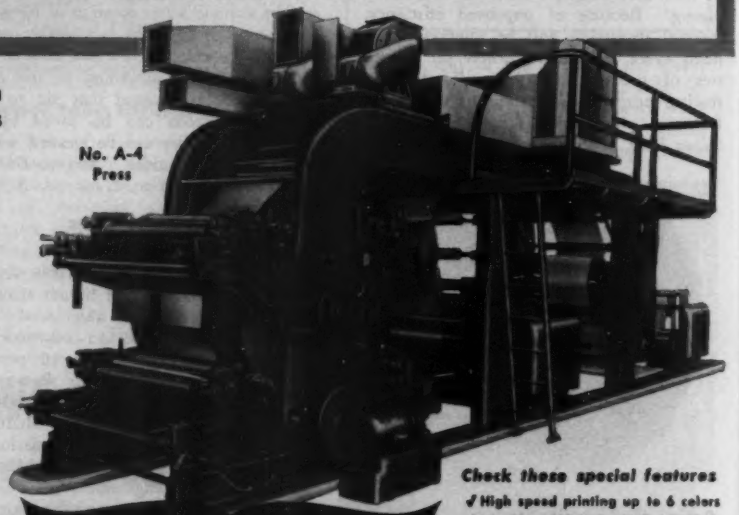

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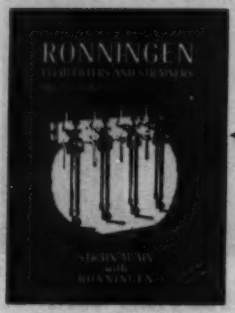
How Paper Mills overcome IRON WATER PROBLEMS



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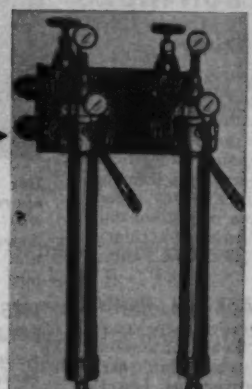

Ronningen Duplex Filter

Many paper mills using deep well water encounter plugged shower nozzles, sprays, and valves, as well as stained wires or containers due to excess iron bacteria, rust, and iron deposit (Fe_2O_3).

RONNINGEN fine mesh wire cloth filters solve this problem effectively and economically.

These units are non short-circuiting, and have sealed ends that keep out foreign matter. Monel metal basket may be scoured out.

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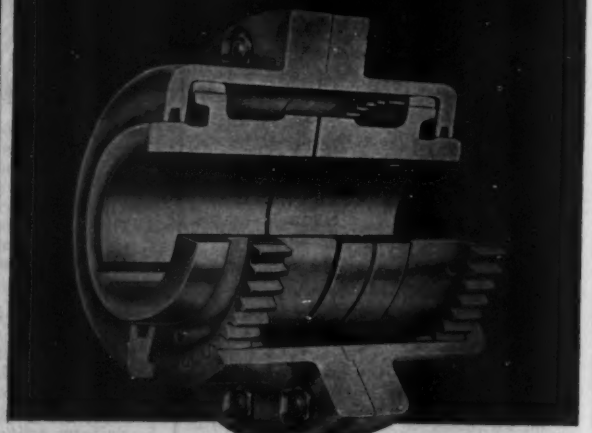

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FLEXIBLE COUPLINGS

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New Products . . . . . .

unusually high degree of parts standardization among pump sizes. All major pump parts, except the volute case, suction cover flange and impeller assembly are interchangeable, model for model.

The "Karbate" Type F centrifugal pump is a motor-mounted design. Pump and motor alignment is automatic. The carbon-to-carbon mechanical seal is self-cooling, self-lubricating and can be adjusted while the pump is running.

The new pump types offer the following: capacities from 5 to 1500 gpm at discharge pressures up to 1,000 psi; mechanical seal with enclosed coolant; rugged Type SN armored connections; maximum interchangeability of parts, and pump efficiencies to 60 per cent. *National Carbon Co., 30 E. 42nd St., New York 17, N. Y.*

Visual sequence annunciator

A new type of annunciator system which automatically indicates the sequence of "off-normal" alarms has been announced. These visual sequence annunciators are desirable where alarms are applied to closely interrelated variables. In most of these applications, if any one of the variables goes "off-normal", the process shuts down.

Sequence indicating annunciators pinpoint the cause of trouble by indicating the first variable to go "off-normal". This is accomplished either by automatic lockout of subsequent signals or by causing the first signal to be red and subsequent signals white. A push-button reset feature which causes the sequence indication to start over again is also available.

Additional signals may be added by adding plug-in units to the common chassis. This annunciator system is available in a standard backlighted nameplate cabinet providing from 3 to 48 signals. *Panalarm Products, Inc., 6312 N. Broadway, Chicago 40, Ill.*

Packaged air compressor

A packaged air compressor in the 75-100 hp range that, according to the manufacturer, approaches the efficiency and economy of larger, more powerful, slow-speed compressors has recently been introduced.

The new machine, known as the "PHE", is an opposed-cylinder, balanced design driven by a direct-connected induction motor. It is a packaged, ready-to-run, heavy-duty unit, arranged in single or multi-stages. The basic design is a two-stage unit for 80-125 psi, but other cylinder arrangements are available for higher pressures or for pumping vacuums. This new model requires very little floor space, a simple foundation, and a minimum of piping and connections. *Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.*

Bucket steam trap

A new type bucket steam trap, manufactured under the trade name "Uni-Trap," employs a balanced valve principle and automatically operates through complete pressure ranges up to 250 psi without adjustments, changing orifices, or valves. This steam trap is especially suited to process industries where load and pressure range vary.

According to the manufacturer, greater capacities of condensate are handled through extra large orifices, and wear and wire drawing of valves and seats is greatly reduced. Dual-Valve (as pictured) makes possible universal application. When the trap is filled with condensate, the bucket opens a small pilot valve, equalizing the pressure on both sides of the large main valve; the pressure immediately becoming balanced allows the bucket to continue its descent and open the large capacity valve, thereby discharging the condensate rapidly.

This new type trap is made in two styles: the standard bottom inlet and top outlet type, and the in-line unit, which may be repaired without removing from steam line. All internal parts are made of stainless steel; valves and valve seats are 500 Brinnel hardness. The steam trap is available in pipe sizes ½ in. through 2 in. *Perfecting Service Co., 332 Atando Ave., Charlotte, N. C.*

Tear strip applicator

An important feature of the new tear strip applicator is its flexibility in applying tape to both corrugated and plain cardboard stock. According to the manufacturer, when used on cardboard blanks, highly satisfactory results in applying tape on .025 in. and .035 in. thick stock at 300 ft. per minute are being attained.

This applicator is made in two models: a portable hand feed model for use on cut blanks and a model for mounting directly over and straddling standard corrugator machines for tape application in continuous manufacturing flow. The latter operates at speeds up to 1,000 ft. per minute. All mechanical controls are anti-friction operating for easy tape location adjustments and smooth operation. *H. G. Weber & Co., Inc., Kiel, Wis.*

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offers these features:

Even distribution of fabric assures EVEN WEARING. Ends of threads contact wire assuring uniform surface to wire. Increased wire life. Many years of trouble free service. Resurfacing reduced to a minimum. Does not absorb water. Doesn't contract or expand. Requires no wet storage or care when machine is down. Easily installed. Greater strength and rigidity. Greater open area.

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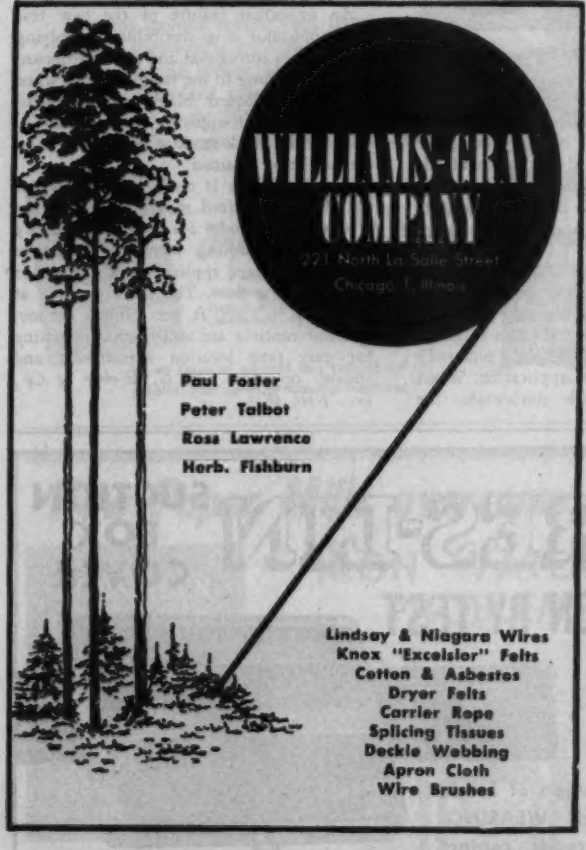
NEW LITERATURE

Booklets and Pamphlets

CAST ALLOY REFERENCE SHEETS. By Norman S. Mott. Published by Cooper Alloy Foundry Co., Hillside, N. J. 8½ x 11. 11 pages. Reprinted from *Chemical Engineering Progress*, this new technical booklet consists of 11 reference sheets covering the major stainless alloys. For each alloy the following information is given: chemical composition, mechanical and physical properties, resistance to major corrosive solutions, machinability, heat treatment, and weldability. In addition, the equivalent ACI, AISI, SAE and ASTM designations are given.

DEINKING BY THE FROTH FLOTATION PROCESS (Bulletin No. F10-B83). By J. W. Jelks. Published by Denver Equipment Co., P. O. Box 5268, Denver 17, Colo. 8¼ x 10¾. 2 pages. This bulletin, which is a paper presented at a recent meeting of TAPPI, describes the mechanics and application of froth flotation to deinking. The future of this process is also discussed.

ETHYLENE OXIDE, ETHELENE GLYCOL, AND DIETHYLENE GLYCOL. Published by Nitrogen Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.



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8½ x 11. 33 pages. This technical bulletin describes fully ethylene oxide, ethylene glycol, and diethylene glycol, giving their uses, chemical and physical properties, handling and storage features and safety precautions. The behavior of each of the materials with other chemicals is portrayed by complete reaction formulas. The bulletin also gives complete analytical procedures to follow to determine color, odor, acidity, impurities, boiling range, specific gravity, etc., for each chemical. Illustrative matter includes charts showing equipment for unloading tank cars and graphs pertaining to safety, humectant values, dew points, specific gravity, vapor pressure and other characteristics.

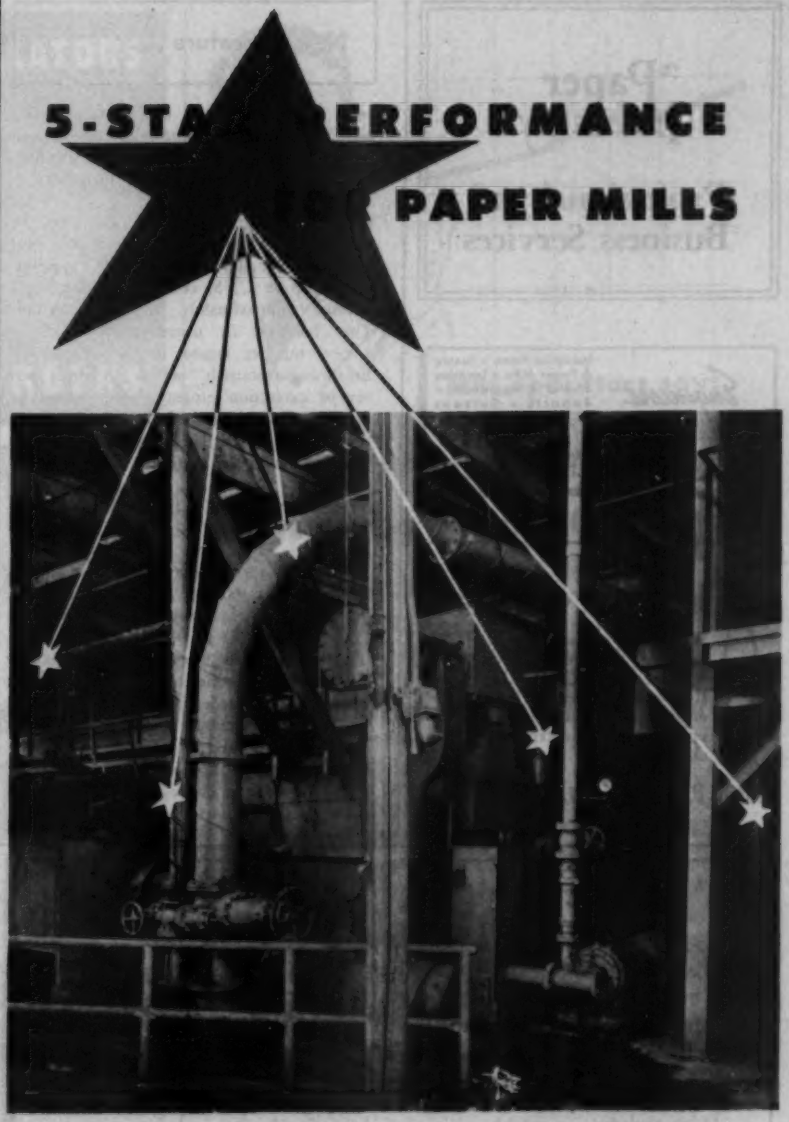
LIST OF PUBLICATIONS ON CHEMISTRY OF WOOD AND DERIVED PRODUCTS (No. R238). Published by U. S. Forest Products Laboratory, Madison 5, Wis. 8 x 10¼. 45 pages. Information about articles and patents dealing with the chemistry of wood and derived products is grouped under the following main headings: General, Chemical Composition of Wood, Chemical and Physical Properties of Wood, Chemical Processing of Wood, Chemistry of Wood Preservatives, and Reports on Forest Products Developments in Germany During World War II. The title of the article, author, publication in which it appeared and the date of publication is given. The number, subject and holder of the patents and the date they were granted is also given. The concluding section gives other publication lists issued by the Forest Products Laboratory.

PARTIAL LIST OF REFERENCE WORKS ON PULP AND PAPER (No. 564). Published by U. S. Forest Products Laboratory, Madison 5, Wis. 8 x 10¼. 7 pages. Information contained in this list includes the title of the publication, edition, author, publisher, date of publication, number of pages, price, etc.

LIST OF PUBLICATIONS ON BOX AND CRATE CONSTRUCTION AND PACKAGING DATA (No. R791). Published by U. S. Forest Products Laboratory, Madison 5, Wis. 8 x 10¼. 17 pages. Sections in this pamphlet of special interest to the manufacturers of paper boxes are those dealing with solid fiberboard and corrugated boxes, general packaging and miscellaneous container data. Publications listed are technical notes, government publications, articles in the trade and technical press, mimeographs, and export shipping data.

SOME ASPECTS OF MANAGING SECOND GROWTH WOODLANDS IN UPPER MICHIGAN. (Station Paper No. 29) By F. R. Longwood. Published by Lake States Forest Experiment Station, University Farm, St. Paul 1, Minn. 8 x 10½. 17 pages. The results of the first five years of cutting on a farm wood lot installed in 1946 on the Upper Peninsula Experimental Forest near Dukes, Mich., are summarized in this paper.

ALCOHOLS (No. F-4731). Published by Carbide & Carbon Chemicals Co., 30 East 42nd St., New York 17, N. Y. 8½ x 11. 52 pages. This booklet discusses in detail 20 alcohols. Uses and suggested applications for the alcohols, their physical proper-



All the lines written about Naylor pipe can not tell the story as convincingly as one line made of it. For more than 25 years, Naylor light-weight pipe with its familiar lockseamed-spiralwelded structure has been giving heavy-duty service in paper mills. Its easy handling and installation, its extra strength and safety, its dependability and economy—all add up to the performance required for today's production schedules. Sizes range from 4 to 30 inches in diameter, thickness from 14 to 7 gauge. All types of fittings, connections and special fabrications available. Write for Bulletins No. 507 and No. 525.

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New Literature . . .

ties, shipping data, specifications, test methods, constant-boiling mixtures, and a list of selected references to these alcohols in the technical literature are included.

FLUID-FLUID-EXTRACTION. Published by Dechema, Frankfurt/Main West 13, Germany. 57 pages. DM 22.80 (approximately $5.45 U. S. coin). (Packing and postage approximately 25 cents extra). This booklet, in mimeograph form, is a new number issued in the "Dechema-Erfahrungsaustausch" series. A short survey of extraction processes is followed by detailed descriptions of individual extraction units. A further section contains all relevant basic calculations, illustrated by examples. A reference to current literature on the subject and a thorough index conclude the booklet.

HOW TO GET WHAT YOU NEED WHEN YOU ORDER A VALVE. By D. P. Thornton, Jr. Published by Cooper Alloy Foundry Co., Hillside, N. J. 8½ x 11. 7 pages. This two-part article reprint from *Petroleum Processing* magazine contains lists of data required when ordering valves for manual operation, power-operated valves, instrument-operated valves, pressure and temperature regulators, traps and level controllers, relief valves, and check valves. It is illustrated with cartoons.

PULP MILL SUPERINTENDENT

Wanted for 600 ton Kraft Pulp Mill in paperboard plant. Must be competent and experienced. Salary open. This position is with a large company and is a real opportunity for a capable person. Address replies to Box 581, The Paper Industry.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Standard Products for Mechanical Power Transmission, etc. Link-Belt Co., Dept. PI, 307 N. Michigan Ave., Chicago 1, Ill.—Catalogue 950 contains descriptive, dimensional and engineering data for selection of standard products for mechanical power transmission, conveying and elevating equipment.

Roll Shafts. Rodney Hunt Machine Co., Dept. IR, Orange, Mass.—"Design and Deflection in Roll Shafts," Engineering Data Report No. 3 on industrial rolls, discusses bending and torsion.

Vibrating Equipment. Jeffrey Mfg. Co., Dept. PI, Columbus 16, Ohio—Catalogue No. 870 is an illustrated and detailed general catalogue on the complete line of Jeffrey-Traylor vibrating equipment.

V-Belt Drive. Worthington Corp., Advertising and Sales Promotion Dept. (PI), Harrison, N. J.—Mailer V-1400-M39, the first in a series of five v-belt drive "Trouble Savers," explains what to look for when v-belt drive doesn't deliver maximum rpm.

Steam-Water Cycle Deposits. Allis-Chalmers Mfg. Co., Dept. PI, 991 S. 70th St., Milwaukee, Wis.—Bulletin 28X8155 on steam-water cycle deposits contains a tabulation giving the mineral name, chemical formula, usual areas in which the deposits are found, the normal causes, and some suggested preventive measures.

Cradle Mounted Pumps. Warren Steam Pump Co., Inc. Dept. PI, Warren, Mass.—Bulletin 247 covers cradle mounted "Compacunits," Types CLFC, CLC, CMC and CHC.

Painting Industrial Chain Link Fences. Subox, Inc., Dept. PI, Fairmount Plant, Hackensack, N. J. The pamphlet "Simplified Fence Painting" briefly outlines the advantages and disadvantages of the methods used for applying paint to these troublesome fences.

Hand Threading Stainless Steel Tubular Products. Babcock & Wilcox Co., Tubular Products Div., Dept. PI, Beaver Falls, Pa.—Folder TDC-147, "Helpful Hints on Hand Threading Stainless Steel Pipe and Tubing," discusses die stock, dies, speed, cutting oils and the assembly of threaded joints.

Valves, Fittings & Castings. Cooper Alloy Foundry Co., Dept. PI, Hillside, N. J.—The bulletin "Technical Information on Stainless Steel Valves, Fittings, and Castings" lists available folders on stainless alloys, stainless steel valves and fittings, and non-metallic pumps, valves, pipe, and fittings.

Photoelectric & Electronic Measuring Instruments. Photovolt Corp., Dept. PI, 95 Madison Ave., New York 16, N. Y.—Bulletin No. 100 contains a list of products and condensed information on photoelectric and electronic measuring instruments.

Filtration. Multi-Metal Wire Cloth Co., Inc., Dept. PI, 1350 Garrison Ave., New York 59, N. Y.—Bulletin No. 544 briefly describes Multi-Metal research, laboratory and field work. It illustrates and describes design improvements in filter leaves and contains a section on selection of filter media.

Meters & Controls. Bailey Meter Co., Dept. PI, 1050 Ivanhoe Rd., Cleveland 10, Ohio—Instrumentation for the modern process plant is presented in Bulletin 17-F.

Chemical Pulping Processes

Chemipulp's high degree of chemical, mechanical and physical control over materials and operations results in maximum plant output, high pulp quality, and low operating costs.

- Circulating Systems
- Chip Distributor
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A Ross-Midwest Hydroscillator on a rewinder prevents wrinkles or hard and soft spots in mill rolls.

It eliminates customer complaints, and the price concessions often forced by faulty rolls.

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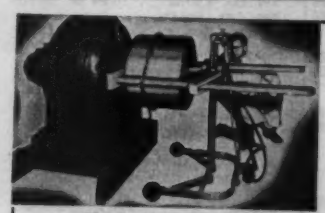

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- 50-ton size as shown $720.50

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For Removing Pulleys, Wheels, Gears, Couplings, Sheaves, Etc.

One man can do it in minutes — even if objects are stuck fast. No crowbars, sledges or blowtorches. No damage to equipment. Puller is adjustable — easy to move — rugged. Hundreds being used in industry.

Write for complete information — Catalog 5

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WANTED — Assistant paper mill superintendent for medium size New England mill — not over 45. Excellent opportunity for advancement. High speed machines. Technical education desirable but not a requirement. All replies confidential. Salary open. Address: Box 575, The Paper Industry.

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Mill operators say:

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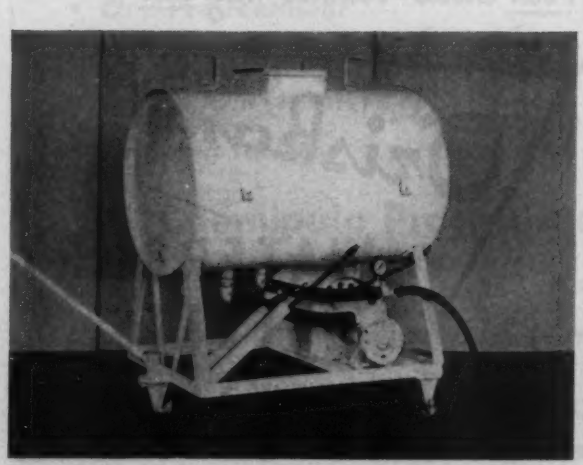


MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are quotations to mills, f.o.b. New York:

No. 1 White Shirt Cuttings	13.00 to 13.50
New Unbleached Muslins	15.00 to 15.50
Fancy Shirt Cuttings	7.25 to 7.50
No. 1 Percales	6.75 to 7.00
No. 1 Washables	3.00 to 3.25
No. 1 Light Silesias	7.00 to 7.25
No. 1 Light Prints	5.75 to 6.00
Light Flannelettes	7.25 to 7.50
Cottonades	3.75 to 4.00
Blue Overalls	7.50 to 8.00
Blue Cheviots	7.00 to 7.50
Canton Flannels, Bleached	11.00 to 11.25
Canton Flannels, Unbleached	11.00 to 11.25
Osnaburg Cuttings	9.00 to 9.50
Underwear Cuttings, Bleached	14.00 to 14.50
Underwear Cuttings, Unbleached	14.00 to 14.50
Khaki Cuttings—	
Sun Tan	6.75 to 7.00
Mixed	3.75 to 4.00
Linen Cuttings—	
American	7.25 to 7.50
White	13.00 to 14.00
Grey	13.00 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing	
No. 1	1.10 to 1.20
No. 2	.80 to .90
No. 3 and 4	.60 to .70
Twos and Blues—	
Repacked	2.25 to 2.50
Thirds and Blues—	
Repacked	2.00 to 2.25
Miscellaneous	1.65 to 1.85
Whites, No. 1—	
Repacked	3.75 to 4.00
Miscellaneous	3.25 to 3.50
White, No. 2—	
Repacked	2.75 to 3.00
Miscellaneous	2.25 to 2.50

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	4.25 to 4.50
Domestic	4.25 to 4.50
Wool Tares—	
Light	4.50 to 4.75
Heavy	4.75 to 5.00
No. 1 Scrap Bagging	3.75 to 4.00
Manila Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.00 to 5.50
Sisal Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	5.00 to 5.25
New Burlap Cuttings	5.75 to 6.25
Jute Threads—	
Foreign (Nom.)	6.00 to 6.25
Domestic	6.25 to 6.50
Strings—	
No. 1 sisal	4.75 to 5.00
No. 2 sisal	4.25 to 4.50
Soft jute	4.75 to 5.00
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	115.00 to 125.00
Hard White No. 1	90.00 to 95.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	55.00 to 60.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	22.00 to 24.00
Mixed Books	16.00 to 17.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 37.50
Manilas—	
New Env. Cuttings	70.00 to 75.00
New Cuts, One-Cut—	
Extra Manilas	17.00 to 18.00
Manila Tab Cards, Free of Ground Wood	80.00 to 85.00
Colored Tab Cards	50.00 to 55.00
Kraft—	
New Envelope Cuttings	62.50 to 67.50
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 32.50
News—	
White Blank	65.00 to 70.00
Overissue	22.00—
No. 1 Folded	14.00—
Old Corrugated Containers	20.00—
New Jute Corrugated Cuts	26.00—
Mill Wrappers	12.00—
Box Board Chips	9.00—
No. 1 Mixed Paper	8.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	5.05—
Ground, cwt.	4.30—
Powdered, cwt.	5.10—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard) 20-30 mesh (bags), lb. 80-100 mesh (bags), lb.	27.00—
Argentine, lb.	24.00 to 26.00
China Clay—	
Domestic Filler	
Bulk (mine) ton	10.50 to 16.00
Domestic Coating	
Bulk (mine) ton	17.00 to 25.00
Imported (ship side)	
Bulk (lump) ton	20.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.93—
Gelatine (silicon), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	29½ to .30
Litharge, powd. bbl. lb.	.16 to .16½

MARKET QUOTATIONS

Rosin (Gum)— New York, per 100 lbs.

E	8.60—
F	8.60—
G	8.60—
WW	8.90—

Rosin (Wood), carlots, F.O.B. South 4.75—

Salt Cake—

Dom. bulk (wks) ton.	21.50 to 22.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	22.00—

Soda Ash—

Bulk (works) cwt.	1.35—
Paper bags, cwt.	1.70—

Soda (Caustic)—

Solid drums, cwt.	3.85 to 4.50
Ground and flake, drums, cwt.	4.25 to 5.00

Sodium Silicate—

60 deg. 55 gal. drums, (works) cwt.	1.60 to 1.70
40 deg. 55 gal. drums, (works), cwt.	1.35 to 1.40

Starch—

Pearl, 140 lb. bags, cwt.	6.39—
Pearl, barrels, cwt.	6.39—
Paper (lip.) bags, cwt.	6.39—
Powdered, barrels, cwt.	6.60—

Sulphur (Crude)

(Mine) bulk, long ton	26.50 to 28.00

Talc—

Dom. 100 lb. bags (mine) ton	25.00 to 28.00
Canadian	35.00 to 45.00

Titanium Dioxide—

Barium Pig, bbls., lb.	.23½ to .23
Calcium Pig, bbls., lb.	.23½ to .23

Zinc Sulphide, bbls., lb. 11.50 to 12.00

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follow:

Bleached Sulphite	140.00—
Bleached Sulphite, Canadian	140.00—
Unbleached Sulphite	120.00—
Unbleached Sulphite, Canadian	120.00—
Bleached Soda	140.00—
Bleached Soda, Canadian	140.00—
Kraft, Bleached	145.00—
Kraft, Bleach., Southern	142.50 to 150.00
Kraft, Bleach., Canadian	145.00 to 150.00
Kraft, Unbleached, Northern	132.50—
Kraft, Unbleached, Southern	95.00 to 105.00
Kraft, Unbleached, Canadian	100.00 to 125.00
Kraft, Semi-Bleached, Southern	140.00—
Sulphite Screenings	72.50—
Sulphate Screenings	67.50—
Groundwood	82.50 to 87.50

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish	135.00 to 140.00
Bleached Sulphite, Norwegian, freight allowed	135.00 to 140.00
Bleached Sulphite, Finnish, freight allowed	140.00—
Unbleached Sulphite, Swedish	115.00 to 122.50
Unbleached Sulphite, Finnish, freight allowed	120.00 to 125.00
Kraft, Unbleached, Swedish, freight allowed	105.00 to 110.00
Kraft, Unbleached, Finnish, freight allowed	105.00 to 125.00
Kraft, Bleached, Swedish, on dock	140.00 to 142.50
Kraft, Bleached, Norwegian	

PAPER

Quotations are mill quotations New York City

Boards—

Prices per ton, delivered, 10 tons or more:

Plain chip	65.00—
News vat lined chip	80.00—
Filled news	67.50—
Solid news	72.50—
White vat lined chip	135.00—
Chip tube and can stock	100.00—
Single manila lined chip	140.00—
Single jute lined chip	125.00—
Kraft liner	117.50 to 122.50

White patent coated:

.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

Machine coated, two sides

70 lb. No. 2 enamel, 25x 38-500, trimmed 4 sides.	4 cases $17.25 Carloads $16.80
45 lb. enamel, 25x38-500, trimmed 4 sides.	4 cases $13.05 Carloads $12.10

Uncoated

55 lb. No. 2 offset, 25x38 500, trimmed 4 sides.	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.40
16 lb. tablet, 17x22-500	Carloads $11.35

Rag Content Bond—

Extra 100% rag	70.45—
100% rag	62.65—
75% rag	48.15—
50% rag	38.90—
25% rag	31.75—

Rag Content Ledger—

Extra 100% rag	72.65—
100% rag	63.90—
85% rag	52.50—
75% rag	49.40—
50% rag	40.20—
25% rag	33.00—

Sulphite Bond—

Air dry bond (Watermarked)	19.00—
No. 1 bond (M.F. watermarked)	15.00—
No. 2 bond (M.F. watermarked)	14.00—
Plain bond (M.F. unwatermarked)	14.00—

Sulphite Ledger—

No. 1, M.F. watermarked	20.50
No. 2, M.F. watermarked	19.50
Plain, M.F. unwatermarked	19.00

News— per ton

Rolls, Standard (Contract)	125.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	133.00—

Tissues (Carlots)— per ream

White No. 1	1.75—
White No. 2	1.35—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.65—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M sht.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M sht.) per cs.	.90—
Toilet, Bleached (M sht.) per cs.	9.35—
Toilet, Unbleached (M sht.) per cs.	7.90—

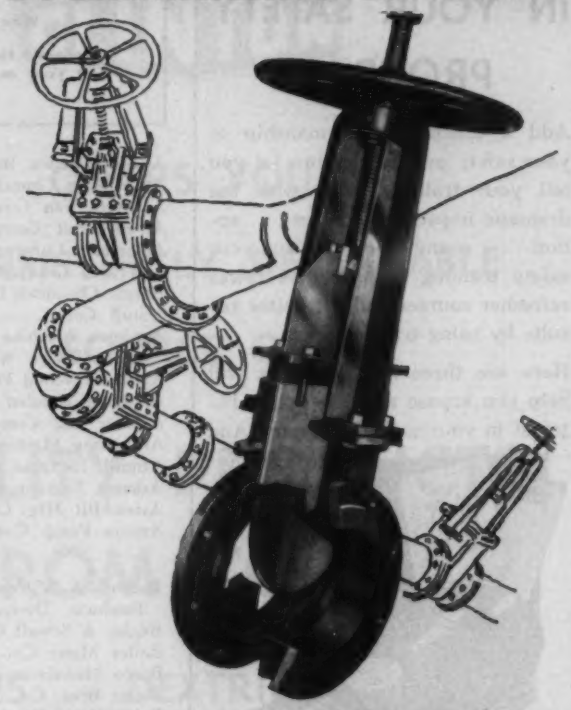
Towels— per case

Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)— per cwt.

Standard wrapping	8.00—
Butchers, counter rolls	8.50—
Standard bag, mill rolls	7.75—
Shipping sack, mill rolls	8.00—
Gumming, mill rolls	8.25—
Asphalting, mill rolls	8.90—
Envelope, mill rolls	9.50—

PREVENT STOCK BUILD-UP BY ELIMINATING "LIP" AREA



WITH NEW ECONOMY "RUBBER SEATING" FABRI-VALVE

New "Rubber Seating" Fabri-Valves completely eliminate "lip" area leaving nothing for stock to "hang up" on. Rubber seats press tightly together when gate is open (see illustration) insuring free flow of heavy solution from port to port. Rubber seats prevent wear and galling on gate, insure tight shut-off for normal flow or back pressure, and can be easily and economically replaced. New "Rubber Seating" Fabri-Valves offer low-cost original installation and reduced maintenance. They cost less...are cheaper to ship and install. Custom fabricated in 4" to 24" size from stainless steel, monel, nickel or any alloy combination.

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PUT ACTION IN YOUR SAFETY PROGRAM

Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

Write for complete information and details to the

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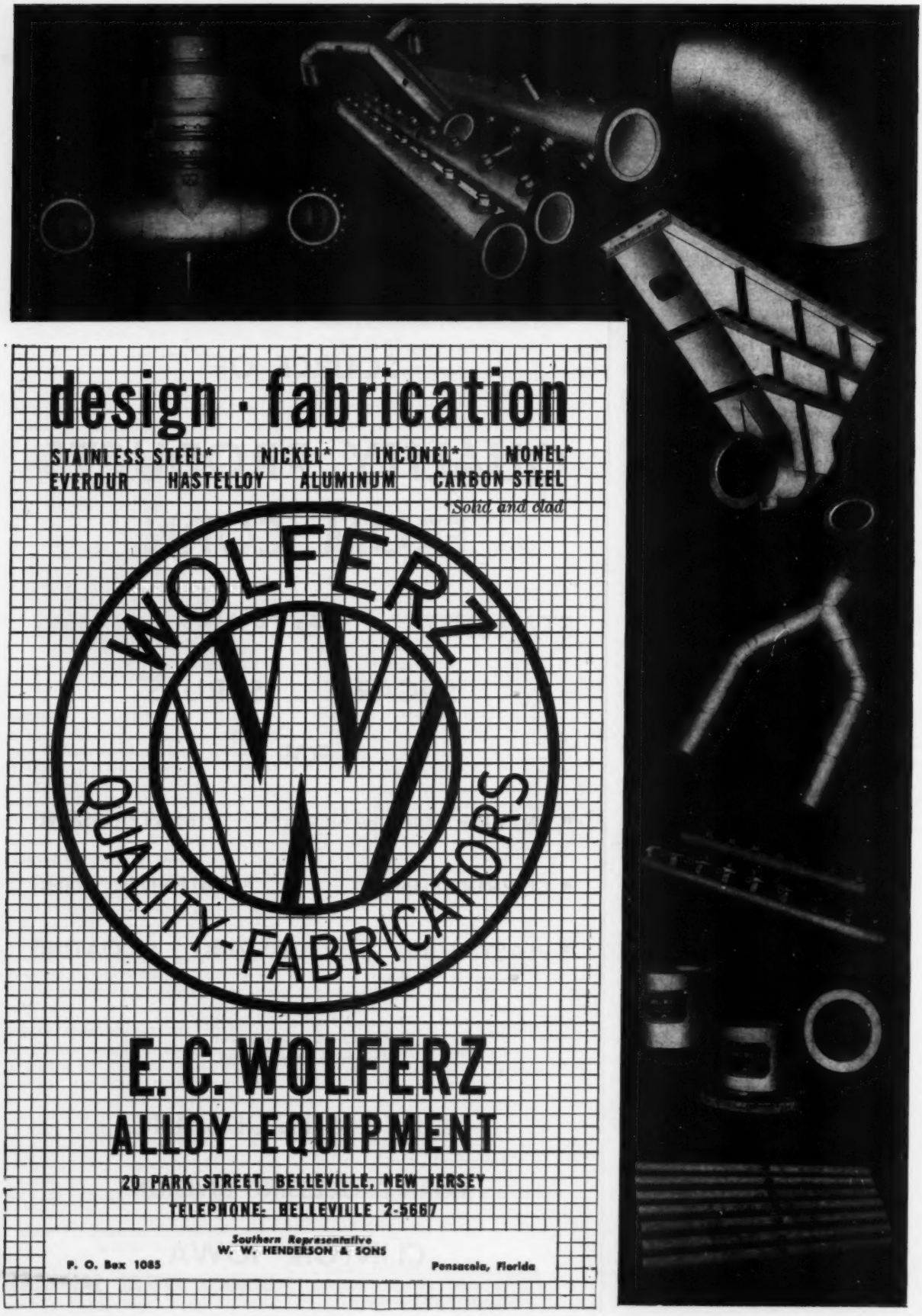
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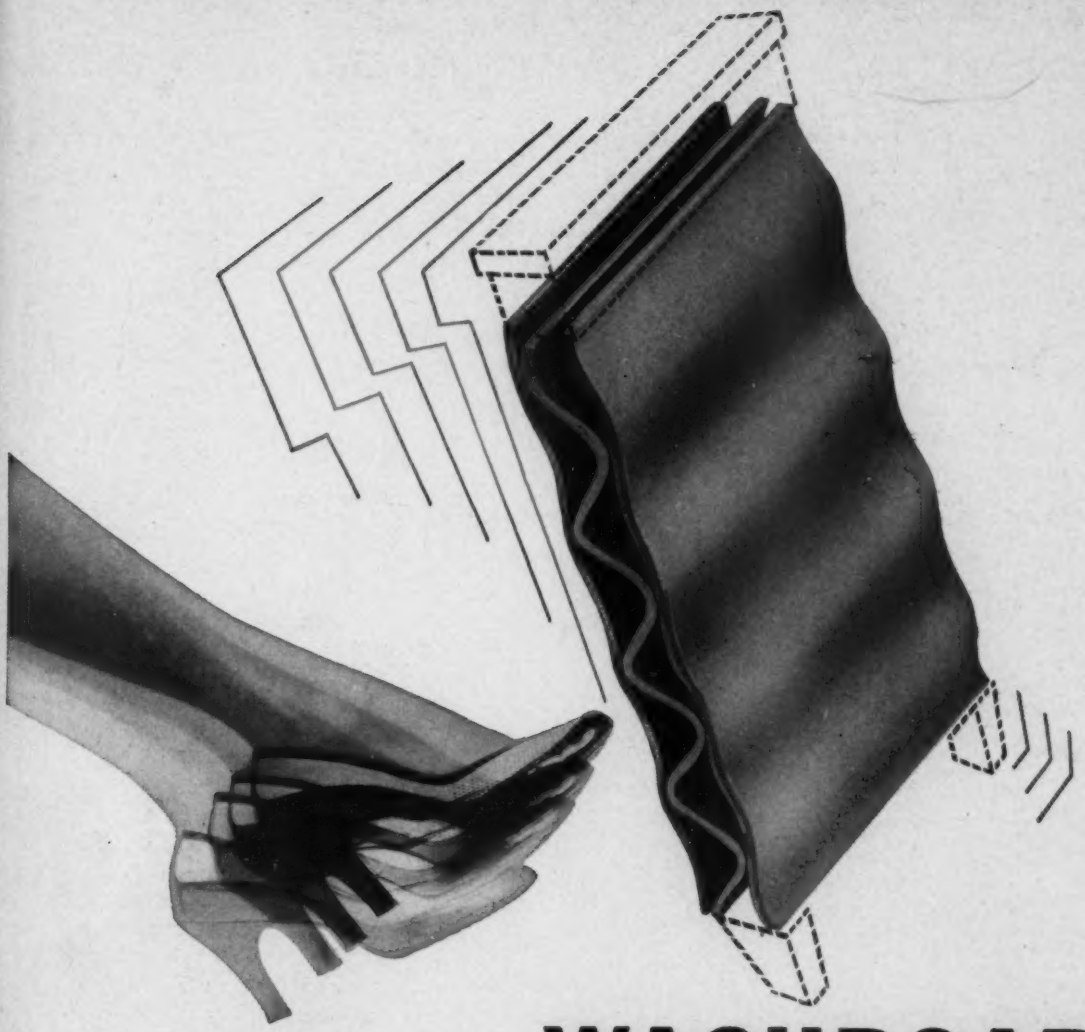

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FIG. 1430

Iron Body Bronze Mounted
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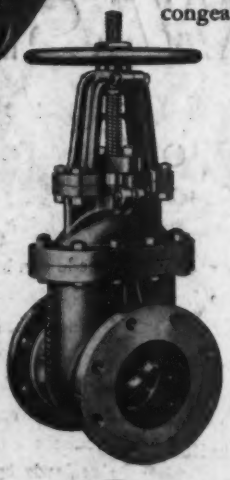
FIG. 1576 and 1578
All Iron
Screwed and Flanged Types
Fig. 1578N-4
3% Nickel Iron with
18-8 Mo (Type 316) Stainless Steel Trim



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